UTAH VALLEY
LONG RANGE TRANSPORTATION PLAN
2003 - 2030

UTAH VALLEY METROPOLITAN
PLANNING ORGANIZATION

ADOPTED MARCH 20, 2003

UTAH VALLEY
LONG RANGE TRANSPORTATION PLAN
2003 - 2030

CONFORMITY DETERMINATION

UTAH VALLEY METROPOLITAN PLANNING ORGANIZATION

MOUNTAINLAND ASSOCIATION OF GOVERNMENTS
REGIONAL PLANNING
586 EAST 800 NORTH
OREM, UT 84097-4146
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ADOPTED MARCH 20, 2003 BY THE UTAH VALLEY REGIONAL PLANNING COMMITTEE

Table of Contents

Section Four
Community and Environmental Impact Assessment

Section Five
Financial Plan

APPENDIX

PUBLIC COMMENTS

CONFORMITY DETERMINATION

UTAH VALLEY REGIONAL PLANNING COMMITTEE RESOLUTION ADOPTING THE UTAH VALLEY LONG RANGE TRANSPORTATION PLAN 2003-2030

TERMS AND ABBREVIATIONS

TABLE OF CONTENTS

MAPS

SECTION ONE - LONG RANGE TRANSPORTATION PLANNING

SECTION TWO - TRANSPORTATION SYSTEM ANALYSIS

SECTION THREE - TRANSPORTATION SYSTEM NEEDS

SECTION FOUR - COMMUNITY AND ENVIRONMENT IMPACTS ASSESSMENT

GLOSSARY OF ACRONYMS AND TERMS

AASHTO	American Association of State Highway and Transportation Officials
ADA	American Disabilities Act
ADT	Average Daily Travel
AOG	Association of Governments
APC/AVL	Automated Passenger Counter/Automated Vehicle Locater
ATIS	Advanced Traffic Information System
BCI	Bicycle Compatibility Index
BRT	Bus Rapid Transit
CCTV	Closed Circuit Television
CHF	Centennial Highway Fund
CM/AQ	FHWA's Congestion Mitigation and Air Quality Management program
CMP	Corridor Management Plan
CMS	Congestion Management System
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information Systems
GOPB	Governor Office of Planning and Budget
HAR	Highway Advisory Radio
HPMS	Highway Performance Monitoring System
ITS	Intelligent Transportation System
LOS	Level-of-Service
LRP	Long Range Transportation Plan
MAG	Mountainland Association of Governments
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standard
NHS	National Highway System
PBCAT	Pedestrian and Bicycle Crash Analysis Tool
PL	Planning Funds (Federal TEA-21)
PM_{10}	Particulate Matter under 10 Microns in size
$PM_{2.5}$	Particulate Matter under 2.5 Microns in size
ROW	Right-of-Way
RTP	Federal Recreational Trail Program
RWIS	Road Weather Information System
SIP	State Implementation Plan for air quality
STIP	Statewide Transportation Improvement Program
STP	The FHWA's Surface Transportation Program
TAZ	Traffic Analysis Zone
TEA-21	Transportation Equity Act for the 21st Century
TCM	Traffic Control Management
TDM	Travel Demand Management
TIP	Transportation Improvement Program
TP+	Transportation Planning Plus (Integrated modeling system for transportation planning)
UDAQ	Division of Air Quality, Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
URBAN SIM	Land Use Forecasting Model
UTA	Utah Transit Authority
VID	Video Image Detection
VMT	Vehicle Miles Traveled
VMS	Variable Message Sign
WFRC	Wasatch Front Regional Council

Michael O. Leavitt
Governor

State of Utah
Department of Transportation

John R. Njord, P.E.
Executive Director

March 3, 2003

Mr. Darrell Cook, Executive Director
Mountainland Association of Governments
586 East 800 North
Orem, Utah 84097 - 4146

Dear Mr. Cook: Darrell:

With regard to the financial projections included in the Mountainland Association of Governments (MAG) Utah Valley Long Range Transportation Plan, 2003 - 2030, we provide the following assessment.

The UDOT Program Development staff has reviewed the financial projections for the aforementioned long range plan, in conjunction with the underlying assumptions used in the development of funding forecasts for projects included in the plan. We find the assumptions related to long term growth in state transportation revenues, federal funding levels, and other state sources to be reasonable in the development of the plan. We concur in the approach adopted by the MAG in determining the amount of funding from these sources that may be available for projects within the Utah Valley urbanized area. Specifically, the share of funds assumed by the MAG from state and federal revenues programmed by the Utah Department of Transportation Commission, federal funds programmed by the MAG, the share of federal funds available as programmed through the Joint Highway Committee, and the amounts distributed via the Class B and C road formula, are reasonable in the amounts presented. We do not offer an opinion on the reasonableness of other local general fund revenues or amounts derived from other private of innovative sources, as these sources fall outside of our oversight responsibilities.

This assessment of the MAG financial projections does not imply that the revenue and distribution amounts would be used for more restrictive budgetary purposes, nor does it constitute a commitment of funds based on the assumptions applied. It is within the context of a planning document, and the associated purposes and objectives of such a document, that these evaluations are made.

Should you have questions about our evaluation or the items contained in this letter, please contact Max Ditlevsen, Program Development Director, at (801) 965 - 4082.

Sincerely,

John R. Njord, P.E.
Executive Director

cc: Mr. David Gibb, Federal Highway Administrator, Utah Division
Max Ditlevsen, Program Development

UTA

March 13, 2003

Darrell Cook
Executive Director
Mountainland Association of Governments
586 East 800 North
Orem, Utah 84097-4146

Dear Mr. Cook:

This letter is in response to your request that the Utah Transit Authority (UTA) concur with the assumptions and conclusions of the Mountainland Association of Governments (MAG) Long Range Financial Plan. Consistent with the requirements of the Metropolitan Planning Process and Joint Planning Regulations, UTA staff participated with the MAG staff in the development of the Long Range Plan and its companion document, the Long Range Financial Plan.

While UTA takes a more conservative approach in some of its financial assumptions used for budgeting purposes, UTA does concur that the assumptions and conclusions of the MAG Long Range Financial Plan are reasonable. If you have any questions or need further assistance please feel free to call me.

Sincerely,

John M. Inglish
General Manager

cc Don Cover, Federal Transit Administration
Harlan Miller, Federal Highway Administration

UTAH TRANSIT AUTHORITY
3600 SOUTH 700 WEST (84119) P. O. BOX 30810 SALT LAKE CITY, UTAH 84130-0810 TEL. 801.262.5626 www.rideuta.com

Darrell

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Division of Air Quality

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DAQP-035-03

March 26, 2003

Harlan Miller
Federal Highway Administration
Utah Division
2520 West 4700 South, Suite 9A
Salt Lake City, Utah 84118-1847

Dear Mr. Miller:

Thank you for the opportunity to review the "Mountainland Association of Governments 2003 Air Quality Conformity Determination Report" for potential mobile source impact on air quality. The Utah Division of Air Quality's preliminary review of the "Conformity Determination Report," which includes the "Utah Valley FY2002-2030 Long Range Plan and 2003-2007 TIP," has not identified any discrepancies.

If you have any questions regarding air quality rules or issues, please feel free to contact Rick McKeague of my staff at (801) 536-4005.

Sincerely,

Richard W. Sprott, Director

RWS/RMcK/gw

cc: Kerri Fielder, EPA Region VIII
Darrell Cook, Mountainland Association of Governments

UTAH VALLEY TRANSPORTATION PLANNING

LONG RANGE TRANSPORTATION PLAN

Mountainland Association of Governments, an association of county and city governments, in cooperation with the Utah Department of Transportation and the Utah Transit Authority has developed this Long Range Transportation Plan. Through transportation planning our communities will maintain access to homes, businesses, recreation, and educational facilities within Utah Valley through the year 2030. The Long Range Transportation Plan specifies a coordinated system of capital-intensive roadway projects, pedestrian/bicycle paths, park and ride lots, transit facilities, airport improvements, freight movements, and private passenger services. These programs are planned to serve existing development and expected growth to the year 2030. The Long Range Transportation Plan contains policies and programs to guide the implementation of these transportation projects. In order for transportation facilities and services to be eligible for federal assistance, they must be included in this Long Range Transportation Plan.

People and goods reaching desired destinations are essential to the economic vitality and lifestyle of Utah Valley. Transportation services and facilities must be planned to serve the needs and values of the community. The community impacts of transportation facilities are analyzed to assure that the facilities and services provided are in keeping with local values and goals. This is accomplished through a complete analysis of social, environmental, economic, visual, land use, and mobility/access implications of the chosen modes, facility designs, and location of transportation infrastructure.

TRANSPORTATION PLANNING ORGANIZATIONS AND COMMITTEES

1. State and Local Agencies Participating in the Planning Process

a. Mountainland Association of Governments (Includes local cities and Utah County)
b. Utah Department of Transportation (UDOT)
c. Utah Department of Environmental Quality, Utah Division of Air Quality (UDAQ)
d. Utah Transit Authority (UTA)
e. Citizen Action Committees and Neighborhood Councils

2. Federal Agencies Participating in the Planning Process

a. Federal Highway Administration (FHWA)
b. Federal Transit Administration (FTA)
c. Federal Aviation Administration (FAA)
d. U.S. Environmental Protection Agency (EPA)

3. Utah Valley Metropolitan Planning Organization

Mountainland Association of Governments is the designated Metropolitan Planning Organization (MPO) for the Provo/Orem Urbanized Area, which is called the Utah Valley Metropolitan Planning Organization, and is responsible for the production for a Long Range Transportation Plan (Long Range Plan) for Utah County. Mountainland's Regional Planning staff is multi-disciplinary with land use, transportation, recreation and water quality planners, traffic engineers, and Geographic Information System experts.

The Mountainland Executive Council is the governing and final decision-making body for personnel and finance policy. The Executive Council also has final approval for the Long Range Transportation Plan. The Utah Valley Regional Planning Committee was established by the Executive Council as a sub-committee to review all plans and programs of the Long Range Plan. The Committee also supervises the long range planning process, is the final policy body for other urban transportation planning matters, and

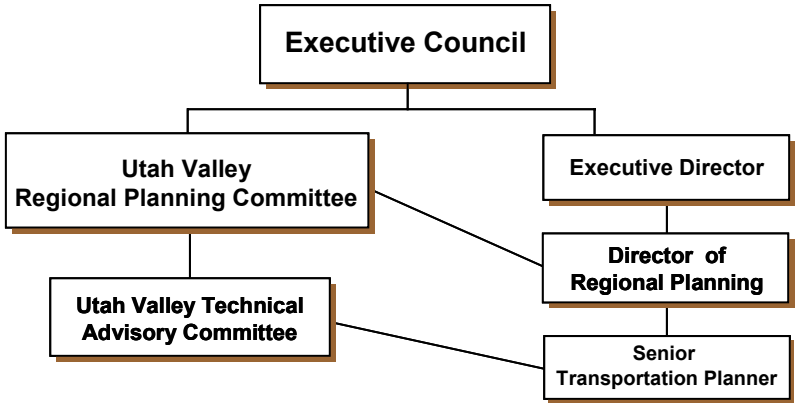
directs staff functions. The Utah Valley Regional Planning Committee is comprised of all the Utah County Mayors, one Utah County Commissioner, a member from the Utah Transportation Commission, Utah State Division of Air Quality, and a board member of the Utah Transit Authority. Representatives from the Federal Highway Administration, Utah State Legislature, Wasatch Front Regional Council's TransCom Committee, freight companies, private passenger carriers, and the airports are invited to attend meetings as none voting members.

The Utah Valley Regional Planning Committee also makes policy decisions on all matters pertaining to air quality. The Committee approves the conformity analysis for air quality policies and procedures for the Long Range Plan and the Transportation Improvement Program.

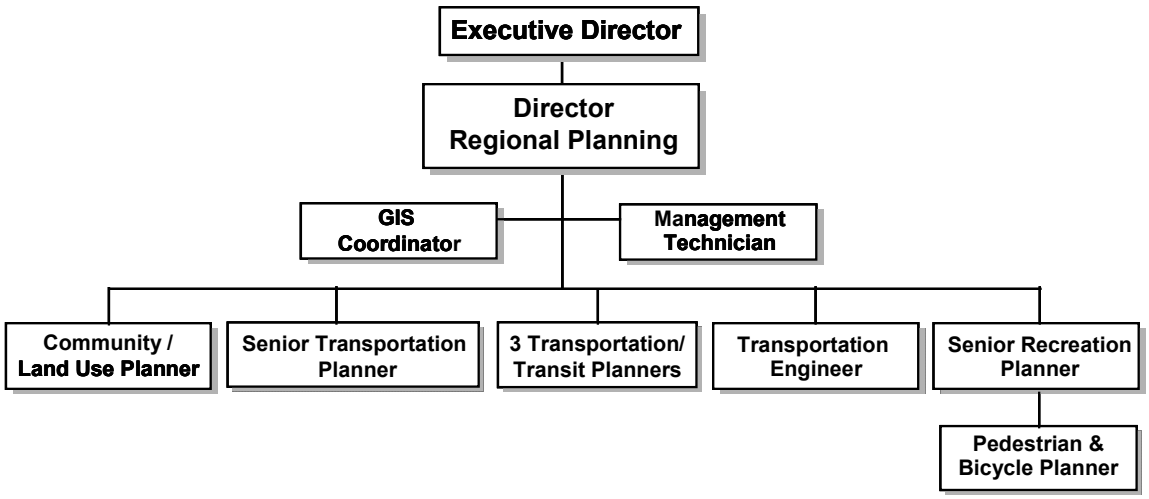
The Utah Valley Technical Advisory Committee was established to advise the Utah Valley Regional Planning on issues of a technical nature and to give suggestions to the Long Range Plan. The Technical Advisory Committee is comprised of engineers, planners, and technicians who serve as staff members to local, state, and federal government as well as service district and private sector representatives from freight and passenger carrier providers. This committee is advisory in nature and serves as a forum for the discussion of transportation related technical issues. Local government units may appoint members to fit their needs. Mountainland staff serves as liaison between the technical and policy committees.

The Long Range Plan is developed in cooperation with the planning staff of UTA, UDOT's Urban Planning Department, UDOT Region 3, and the Mountainland Regional Planning Department.

METROPOLITAN PLANNING ORGANIZATION OF MOUNTAINLAND ASSOCIATION OF GOVERNMENTS



METROPOLITAN PLANNING STAFF



FEDERAL PLANNING REGULATIONS

TRANSPORTATION EQUITY ACT FOR THE 21ST CENTURY

Transportation Equity Act for the 21st Century (TEA-21) determines much of Mountainland's planning activities as the Metropolitan Planning Organization for Utah County. Metropolitan Planning Organizations, under TEA-21 are designated to develop transportation plans and programs for urbanized areas in cooperation with the State and public transit operators. TEA-21 provides the planning strategies, goals, and responsibilities for the MPO. TEA-21 expires in September 2003; at which time Congress may authorize a new transportation bill for FY-2004-2009 or approve continuing authorization.

The plans and programs of the MPO provide for the development, the integrated management and operation of the Functional Classified Road System, transit system and other regional transportation projects. These transportation modes together will function as an intermodal system for the metropolitan area and will be an integral part of the State and Untied States transportation system. All modes of transportation will be considered when developing plans and programs.

The following are the seven TEA-21 transportation planning goals:

1. **Support the economic vitality of the metropolitan planning area, especially by enabling global competitiveness, productivity, and efficiency**
   a. Recreation and tourism are major contributors to both the economy and the tax base of Utah County. Travelers (leisure and business) spend about three hundred million dollars per year in Utah County. The county has a transient room tax in place that contributes about six million dollars per year to the tax base. Transportation expenditures total about 40% of these expenditures. Providing an efficient and convenient transportation system helps to maintain this level of travel in the area and will help to make this grow.

   b. Freight traffic through the county includes truck and rail. There are no major intermodal centers in Utah County. Freight routes throughout the county have been mapped in the long range plan. Freight movements are included in the travel demand modeling and rail freight is accounted for as well. Industry is dependent upon the support of a freight system for movements of goods; therefore special care is taken to assure the free flow of trucks and rail.

   c. Employment centers are included in travel modeling and are considered in all transportation decisions. Commercial development is a major generator of traffic with two major regional malls being located in Utah County. There are also two major colleges, Brigham Young University and Utah Valley State College. All of these are treated as special generators in the travel demand model for the county. The transit system is designed taking them into consideration as well as the non-motorized transportation system providing access for walkers and bikers.

   d. Utah Valley's airport planning is done by Mountainland staff and UDOT's Division of Aeronautics. The largest airport in the region is the Provo Municipal Airport. The Metropolitan Airport Systems Plan, adopted by Provo City in 2000, shows expansion of the airport with construction scheduled in the coming years. It is the intent to add commercial air service when a tower and radar capabilities become available at the Provo Airport. Providing access to the airport will help assure the success of the expansion and will be needed to maintain the travel speeds on the facilities existing in the area.

2. **Increase the safety and security of the transportation system for motorized or non-motorized users**
   a. Pedestrian and bicycle facilities have been the focus of Mountainland and the city staffs of Utah County. Several programs are in place to assure safety for non-motorized travelers including: a safe trip to school program and Pedestrian Crossing Safety group. Both groups look at improvements to pedestrian crossings, access of school children to school facilities

and funding for needed improvements. Mountainland staff has completed an update of the Utah Valley Non-motorized Transportation System that includes trails, paths and sidewalks linking destinations with residential areas, each city with its neighbors, and Utah County with Salt Lake County. Thereby addressing the safety of the non-motoring public.

b. High prioritization of improvements in high-risk areas is another instance of increased safety and security in the Long Range Plan. Several areas in the county have high incidents of accidents, Spanish Fork Canyon US-6 being the best example. This facility has been the focus of fund raising activities and planning for the county. UDOT has contributed FHWA Surface Transportation Program (STP) funds toward reconstruction of the urban portion of this facility. The location of unsafe conditions increases the priority of projects in the Long Range Plan.

c. Integration into special studies of the concepts of security and safety is a key toward assuring that future projects will address these issues.

3. Increase the accessibility and mobility options available to people and for freight

a. Freight movement and mapped routes: It appears that the greatest threat to access and mobility for freight within the MPO is congestion and low level of service along important pass-through corridors. Improvements to routes, management and operations, ITS, and other congestion mitigation activities are called for in the Long Range Plan and include considerations of movement of goods. Implementation will improve freight operations and mobility.

b. Multi-modal approach: The MAG multi-modal approach to transportation planning seeks to improve access and mobility for all persons, regardless of the desire or ability to operate an automobile. Inclusion of transit services and non-motorized transportation options within the transportation system are key to this approach.

c. Non-Motorized transportation system plan: The Non-Motorized transportation system plan looks to improve access and mobility for all with a comprehensive system of options including sidewalks, trails and bike lanes where needed and appropriate. Adherence to ADA requirements in design and construction is promoted to properly accommodate less-able persons.

d. Airport expansion study (people and freight: Prior to September 11, 2001, activities at Provo Airport were projected by the Federal Aviation Administration to double by 2015. Since that time, worldwide aviation demand has not increased as anticipated, and no expansion actions are anticipated. However, procedural and functional improvements including retaining the radar and traffic control added to the airport during the 2002 Olympics will improve air operations and provide additional options for movement of people and freight.

4. Protect and enhance the environment, promote energy conservation, and improve quality of life

a. Energy conservation is achieved through the transportation plan by moderating speeds that are increased in congested areas and providing a balance of functional classes with appropriate speeds for land access.

b. Vehicle miles of travel are reduced when the build and no-build scenarios are compared. In all instances the no build scenario resulted in higher mobile source emission rates thus more environmental damage. The reduction of air pollution has been a goal throughout the creation of the Long Range Plan.

c. Use of traffic management programs such as Intelligent Transportation System, Congestion Management System, Rideshare, Flextime, Transit, and non -motorized system improvements conserve energy by reducing vehicular travel and reducing congestion hence vehicle idling.

d. Conservation is addressed in the Community Impacts and Environmental Justice section where proposed facilities are mapped with environmental and social factors to define areas of possible conflict or concern.

e. Quality of life has been and will continue to be addressed through planning activities evaluating land use policies and city general plans on transportation demands. Mountainland wishes to maintain a balanced transportation system for the future that minimizes negative impacts on communities and maximizes our ability to provide access.

5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight

a. Modeling of the transportation system has been upgraded in the past year to include a capability to project pedestrian and bicycle usage, improved transit projections through premium transit services and consideration of land usages. This has increased the staff's ability to project the results of improvements to the walkability of an area as well as transit improvements. The model projects areas in the county where improvements are needed, then justification for improvements can be presented to the policy making committee and projects can then be planned, funded, and implemented.

b. Cooperation with cities and UDOT on establishing the National Highway System and the Functional Classified Road System are the key to ensuring the connectivity of the transportation system. Mountainland staff along with UDOT, FHWA, and city engineers analyzes and make on-sight tours of the roads throughout Utah County. This group suggests changes in the Functional Classified Roads System that are then changed through the MPO committee structure and the UDOT Transportation Commission.

1) This is done at least every three years, resulting in a well-balanced system connecting Utah Valley with the outlying counties and states.

c. UTA, UDOT, and cities participating in the Utah Valley Congestion Management System look at the many ways to improve mobility and access via Intelligent Transportation System, Transit, Intersection Improvement, etc. This group looks at the county as a whole focusing on areas where congestion may be impeding travel and make suggestions to improve that area. This aids the movement of people and freight.

6. Promote efficient system management and operation

a. Congestion Management System although sited throughout this section does touch all aspects of the transportation system. Through system analysis of all proposed projects and solution to congestion the management of the system is assured to be efficient.

b. Multi-modal approach also helps to maximize the transportation investment by providing options to travelers, enhancing access to areas by means other than the car. This then reduces the demand on the highway system, needed capacity increases, and maintenance. It increases efficiency and operation of the existing system.

7. Emphasize the efficient preservation of the existing transportation system.

a. Sufficient funds are committed in the financial plan to insure that existing facilities are preserved before new ones are constructed.

b. The Congestion Management System includes an analysis of all improvements possible prior to capacity increases for each funded project. This management system in described in detail in the Long Range Plan and will help alleviate capacity increases that can be avoided through other transportation management strategies.

TRANSPORTATION MANAGEMENT AREAS

Large urban areas with a population over 200,000 and air quality non-attainment areas are classified as Transportation Management Areas and must fulfill additional planning to be eligible to receive federal funds. Federal guidelines for planning increase to assure adequate public involvement, social and environmental analysis, and financial constrain. The Provo / Orem Urbanized Area has a population of over 360,000, hence is a Transportation Management Area. Utah County is classified as non-attainment for particulate emissions (PM_{10}); Provo is classified as non-attainment for carbon monoxide. The following sections describe the planning programs in our area:

CERTIFICATION

In Transportation Management Areas, the U.S. Transportation Secretary must certify the planning process for the metropolitan area at least every three years. If not certified after September 20, 1993, the U.S. Transportation Secretary may withhold all or part of a portion of Surface Transportation Program apportionment and formula apportionment of FTA funds. If an area is not certified for two consecutive years after September 20, 1994, 20% of attributable STP and FTA funds must be withheld. Funds are restored when area is certified.

The Utah Valley Transportation Planning Process was certified after going through the Three C Certification processes in 1994, 1997, and 2000. The next certification process is scheduled for 2003.

METROPOLITAN PLANNING AREA CHARACTERISTICS

GEOGRAPHY

The Utah Valley MPO planning area boundary encompasses all the communities in Utah County and is located at the southern end of the rapidly growing metro area along the Wasatch Front. The MPO area is bounded on the north by the Salt Lake County-Utah County line. This boundary provides not only a political separation, but also a physical one. The Traverse Mountain range runs east and west and is often referred to as "The Point of the Mountain" separates Salt Lake and Utah Counties. The MPO area is restricted by the Wasatch Mountains on the east. These mountains have such a steep western face; it is unlikely that any major development will occur higher than the foothills. The southern boundary of the MPO area includes the Utah-Juab County line. Finally, the western boundary reaches to the community boundaries of Cedar Fort, Eagle Mountain, and Saratoga Springs then to the west of Redwood Road to the Utah-Juab County line. (See the MPO Area Map)

The MPO area is linked to the north by I-15, a six-lane freeway; Redwood Road (SR-68), a two lane state highway; and I-15 frontage roads. The MPO area can be accessed from the east by two roads US-189 (through Provo Canyon) and US-6/US-89 (through Spanish Fork Canyon). Western access is SR-73 Lehi Main Street to Cedar Valley and SR-6 from Eureka through Santaquin to Spanish Fork Canyon. Southern access is I-15 and SR-198. Within the MPO area US-89, which is commonly referred to in most communities as State Street or Main Street, runs from north of Lehi to Spanish Fork in the south. The narrow northern corridor accommodates two railroads, major water aqueducts, electric power transmission lines, natural gas lines, and communication lines.

The Utah Transit Authority provides local public bus service to the MPO area and express route service to Salt Lake City. There are municipal airports in both Provo and Springville/Spanish Fork. Amtrak provides daily passenger rail service from Utah County to San Francisco, Denver, and Chicago. The current service originates at the Provo Station. While taxi service is available, most taxi companies are located in Salt Lake City and are seldom used in Utah County. Non-motorized transportation is becoming a very popular mode of transportation for the residents of Utah County.

ENVIRONMENT

Air quality is a major environmental concern in Utah County. Utah County is a moderate non-attainment area for particulate matter smaller than ten microns (PM_{10}). Provo City has been designated as a non-attainment area for carbon monoxide by the Environmental Protection Agency. The valley is surrounded by high mountains, which often create winter temperature inversions that can trap pollutants in the area for days at a time.

Utah Lake and surrounding wetlands play an important role in the area's environment. Utah Lake is also a critical link in the migratory bird flight path from Canada to Mexico. The lakebed is so flat; a rise in the water elevation of merely a few feet can flood hundreds of acres of land and cause major impacts on wildlife, agriculture, industry, recreation, and transportation facilities. Careful planning of future transportation facilities should include an evaluation of the fluctuating water levels of Utah Lake and its role in the area's environment.

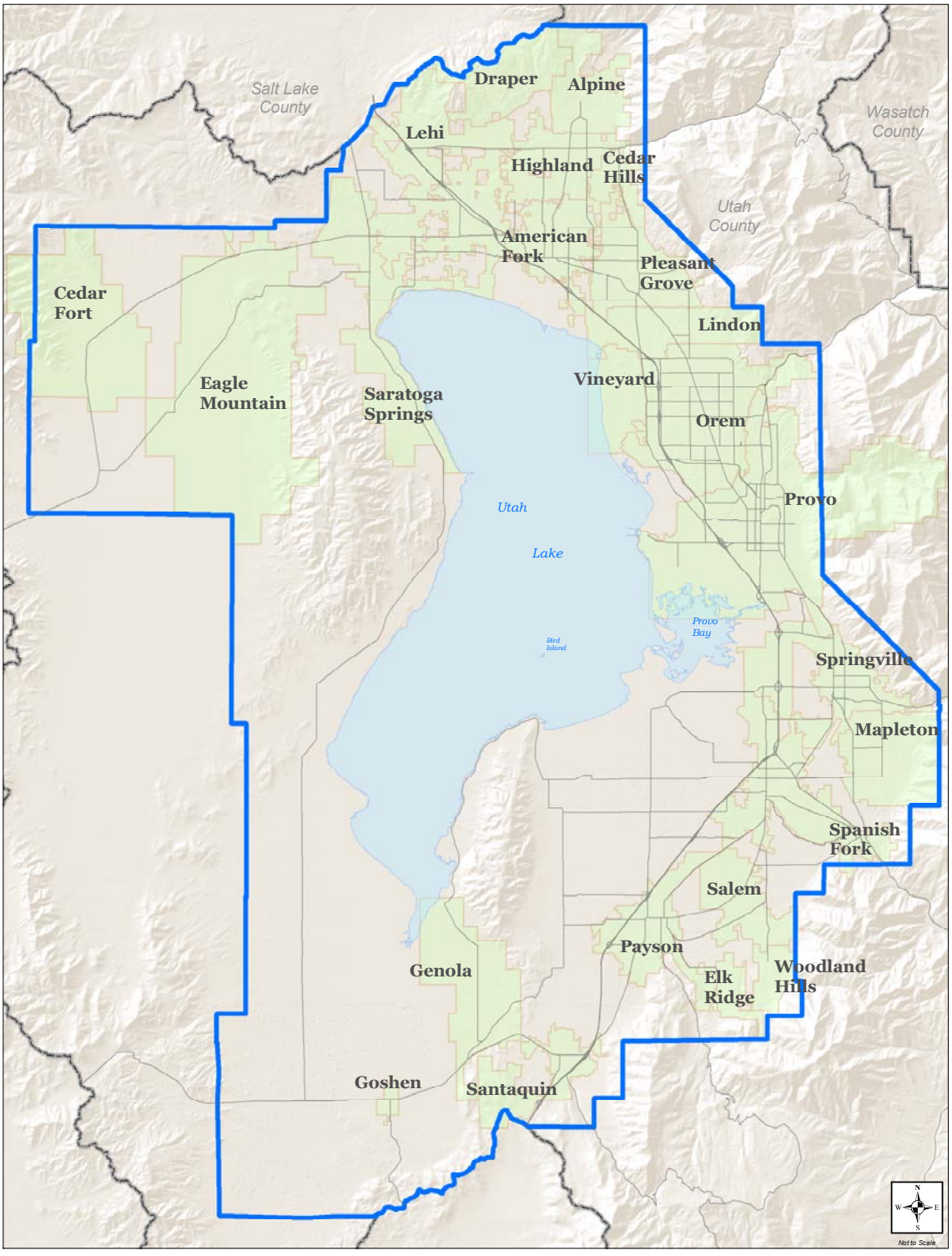
Utah Valley's environment presents both opportunities and potential problems for the region. The proximity of Utah Lake and the Wasatch Mountains offer excellent opportunities for recreation and other uses, thus helping to attract and retain many residents. The mountains and canyons offer open space, recreation, and clean water to Utah Valley, while limiting developable land. The canyon and mountain areas are given special consideration in preparing the Long Range Plan.

POPULATION

Utah Valley was settled in 1847 and has experienced continuous growth. Until recently growth has

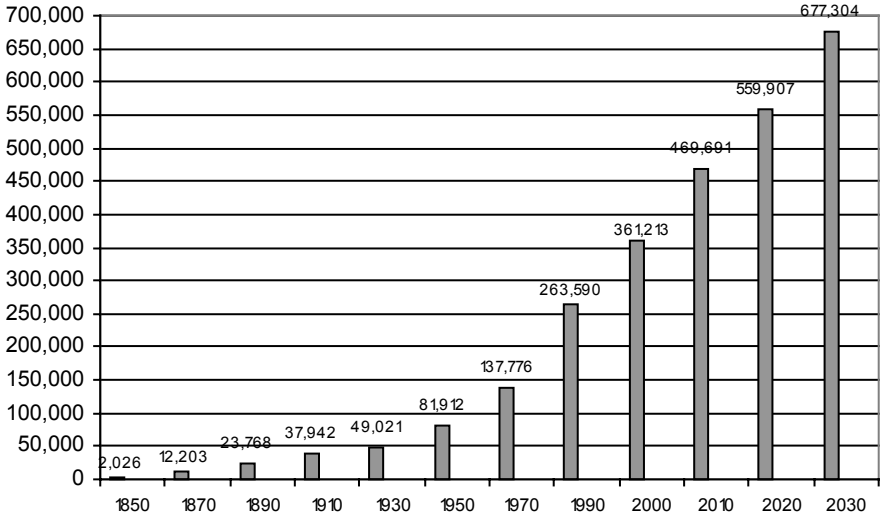
centered around the Provo / Orem area near the Provo River, which is the largest river in Utah County. The 1850 census recorded 2,026 residents in Utah County; by 2000 that number had grown to over 368,000. The Governor's Office of Planning and Budget projects the County population to be 677,304 by the year 2030.

METROPOLITAN PLANNING AREA



Most of the population of Utah County lies east of I-15 and west of the Wasatch Mountains as shown in the "Population Density Map." A high water table and agricultural industries have deterred the development of the areas west of the freeway.

Utah County Population
1850 - 2030



Source: 2000 Census and Governor's Office of Planning and Budget

EMPLOYMENT

The economy of Utah County has evolved from an agricultural and heavy metals producing area and to a smaller version of the "Silicon Valley." High tech companies, such as Novell have spurred a diversified economy. Education and post-secondary education are major employers in Utah County. Three public school districts, Alpine, Nebo, and Provo provide primary and secondary public education. Two major post-secondary institutions are Brigham Young University and Utah Valley State College.

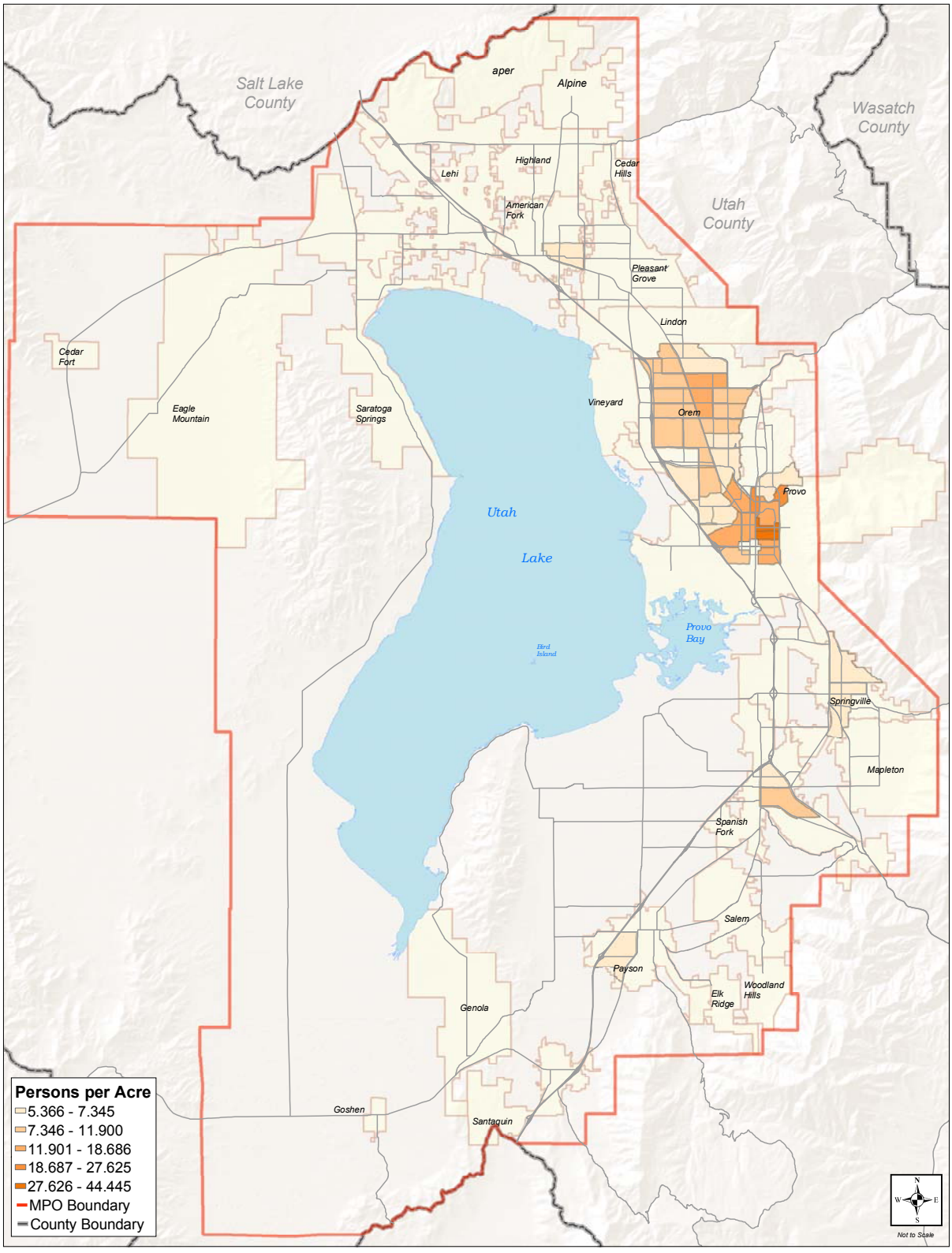
The increase in total non-agricultural employment has been a contributing factor to the continued growth of population and travel development. The Utah County Employment by Economic Sector table shows the growth of non-agricultural employment between 1980 and 2030. Between 1990 and 2000 the amount of non-agricultural employment increased by 60% in Utah County, with corresponding traffic growth.

Utah County Employment by Economic Sector
1980 - 2030

Sector	1980	1990	2000	2010	2020	2030
Agriculture	2,557	2,555	2,686	2,548	2,355	2,179
Mining	359	40	44	59	72	83
Construction	3,322	2,989	10,795	11,166	13,663	16,357
Manufacturing	12,972	14,089	19,684	22,004	24,877	28,680
Transportation / Utilities / Communications	2,172	2,518	2,386	3,088	3,805	4,632
Retail Trade	12,638	21,929	34,110	42,366	50,260	60,227
Finance / Real Estate / Insurance	2,015	2,275	4,678	5,933	6,977	8,263
Services / Education	20,377	36,415	58,970	82,613	101,607	121,080
Government	11,125	14,660	19,998	26,787	31,316	36,321
Other	12,028	20,874	36,065	50,589	61,639	73,357
Total Employment	**79,565**	**118,344**	**189,386**	**247,153**	**296,602**	**351,179**
Non-Farm Employment	63,884	93,933	149,665	192,916	231,501	274,466

Source: Employment Projections 2000 Baseline, Governor Office of Planning and Budget

POPULATION DENSITY MAP
CENSUS 2000



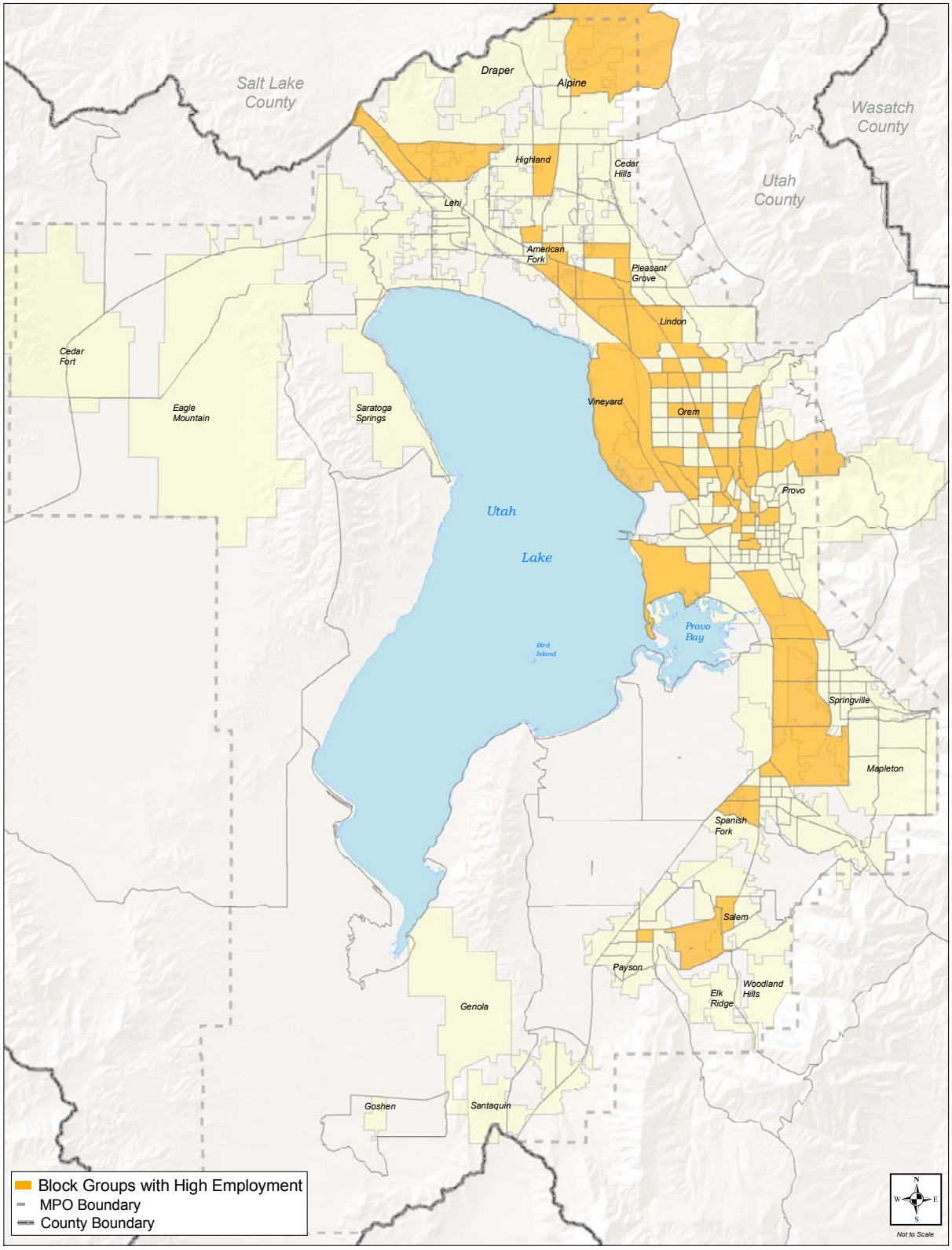
The Utah County Major Employers Directory, 2002, lists 206 businesses, which employ 100 people or more in Utah Valley. The businesses that have 350 or more employees are listed below.

EMPLOYERS BY CLASSIFICATION AND NUMBER OF EMPLOYEES 2002

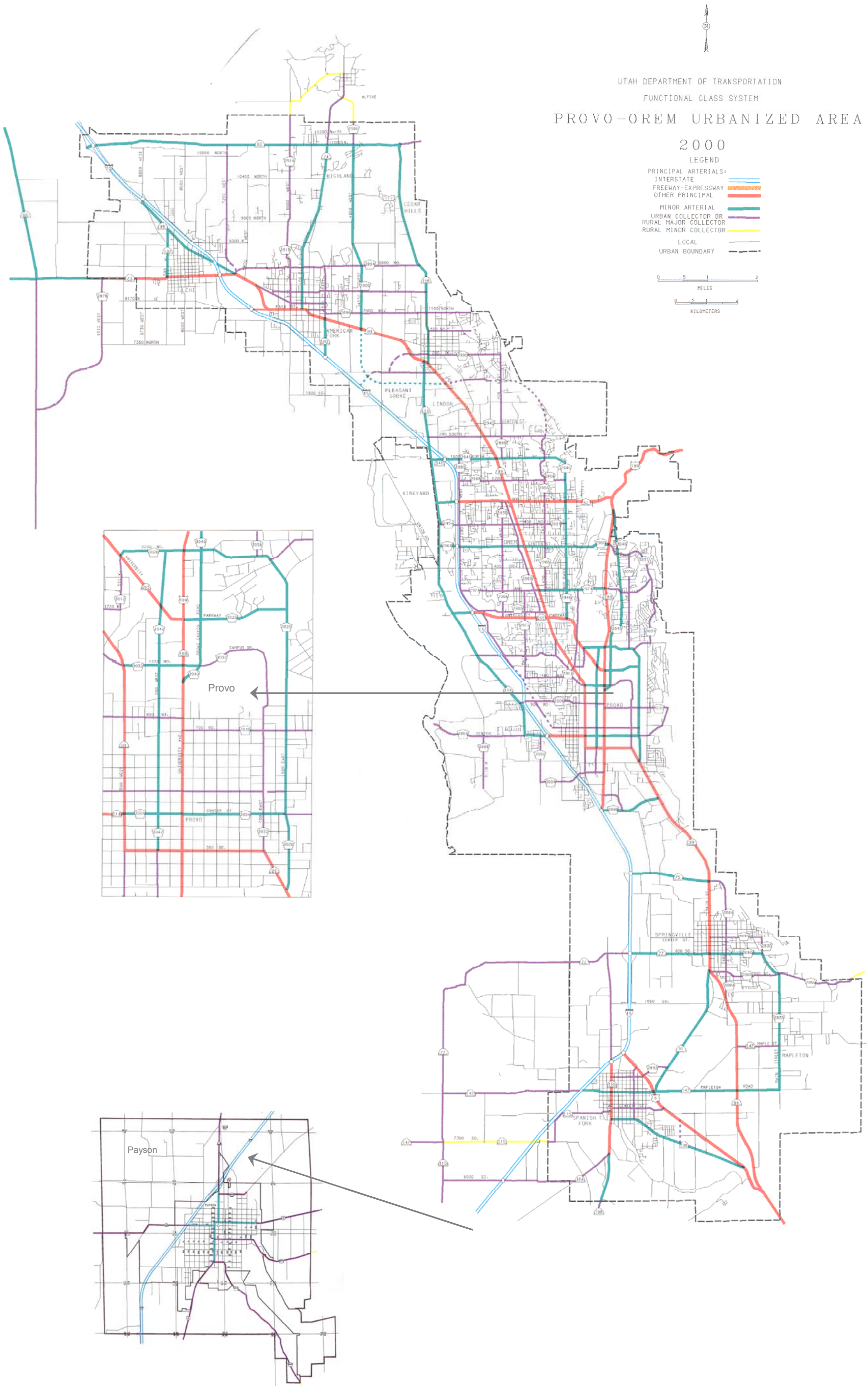
Employer (Location)	Classification	# of Employees
Brigham Young University, Provo	Education / Service	14,500
Alpine School District, North Utah County	Education / Service	6,213
IHC Health Care Services, Utah County	Medical	3,650
Utah Valley State College, Orem	Education / Service	3,165
Nebo School District, South Utah County	Education / Service	2,371
Convergys- Orem	Service	2,000
Provo School District, Provo	Education / Service	1,900
Nestle Frozen Foods, Springville	Manufacturing	1,800
Novell, Provo	Manufacturing	1,800
Modus Media International, Lindon	Manufacturing	1,200
NuSkin, Provo	Service	1,100
Utah County Government Offices, Provo	Government	920
Micron Technology, Inc., Lehi	Manufacturing	900
Utah State Development Center, American Fork	Education / Service	850
Orem City	Government	800
Albertson Stores, Utah County (7 stores)	Retail	760
Utah State Hospital, Provo	Medical	730
Macey's Stores, Utah County (3 stores)	Retail	725
U.S. Post Office, Utah County	Government	700
Marketing Ally, Provo	Service	700
SOS Temporary Services, Utah County	Service	700
Provo City	Government	620
Nature's Sunshine, Provo	Manufacturing	600
Business Computing Services, Inc., Provo	Service	600
Wal-Mart, Utah County (2 stores)	Retail	590
K-Mart Stores, Utah County (4 stores)	Retail	500
Neways, Salem	Manufacturing	500
Sento Technical Innovations, Orem	Manufacturing	500
Manpower Temporary Service, Orem	Service	500
PGM, Inc., Orem	Research	500
Utah State Office Building, Provo	Government	500
Labor Ready, Provo	Service	500
American Land & Leisure, Orem	Service	500
Mountain View Hospital, Payson	Medical	450
Kelly Services, Inc., Provo	Service	441
Walker Oil Company, Utah County	Retail	440
Flowserve, Springville	Manufacturing	430
Liberty Safe, Springville	Manufacturing	420
Kencraft, Inc., Alpine	Manufacturing	400
Morinda, Provo	Manufacturing	400
Provo Craft Warehouse, Provo	Retail	400
Adecco Employment Service, Orem	Service	400
Shopko, Utah County (3 stores)	Retail	390
Thanksgiving Point, Lehi	Service	380
Digital Technology International, Orem	Service	370
Smith's Food & Drug, Utah County (3 stores)	Retail	365
Westaff, Orem	Service	350

Source- Utah County Major Employers Directory, January 2002

EMPLOYMENT BY 2000 CENSUS BLOCK GROUPS MAP
JULY 2000

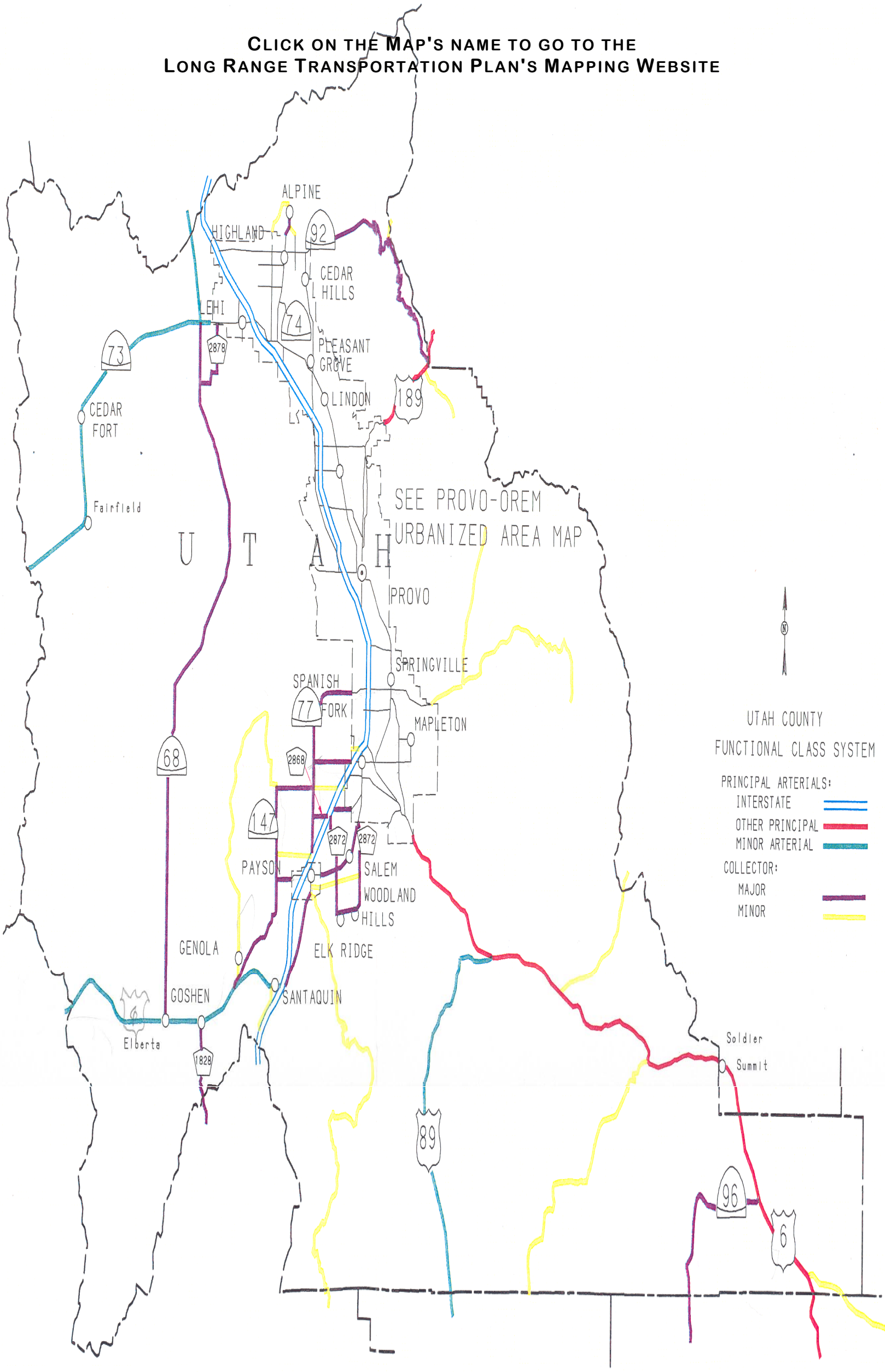


FUNCTIONAL CLASSIFIED ROAD SYSTEM - URBANIZED AREA



FUNCTIONAL CLASSIFIED ROAD SYSTEM - UTAH COUNTY

CLICK ON THE MAP'S NAME TO GO TO THE
LONG RANGE TRANSPORTATION PLAN'S MAPPING WEBSITE



FUNCTIONAL CLASSIFIED ROAD SYSTEM

Functional classification defines the role that each street, road, and highway will play in moving traffic from trip origins to destinations. Access is best served by streets with driveways and parking spaces convenient to the individual origin or destination of each traveler. Mobility is best served by controlled access highways where there is minimum interference with the main traffic flow from side traffic. Since it is impossible to build a freeway between each origin and destination a compromise is needed; one that will provide the best practical balance between serving access and mobility.

The **Interstate System** provides full control of access, allowing smooth flow of through traffic with minimum disruptions by traffic entering or leaving the system. **Principal arterials** provide mobility but still allow access to many bordering activities. **Minor arterials** connect to principal arterials and carry traffic between less popular destinations and allow a greater degree of access. **Collectors** connect scattered developments and neighborhoods while providing access to activities along their routes. Finally, **local roads** provide access to all roadside activities, homes, stores, business locations, etc. In combinations the network formed by these various types of roads accommodate highway travelers.

COMMUTER CHARACTERISTICS

Future transportation problems will occur as a result of high travel demands throughout the area. Most of the current jobs and a majority of the expected future employment growth occurs in the Provo / Orem area. Although it is expected that some future employment opportunities will be disbursed throughout the County, the Provo / Orem area will continue to be the hub of employment activity. The linear configuration of urban development, leads to heavy usage of I-15. With no improvement I-15 will be highly congested by 2010.

The number of workers commuting from Utah County to Salt Lake County has always been larger than the reverse commute. This trend is slowly changing. In the Census 1990, 10.6% of all Utah County workers were employed outside of Utah County. According to Census 2000 that percentage was lowered to 8.3%. The amount of work trips from Salt Lake County south to Utah County have increased by 147% since in the 1990 Census, whereas work trips from Utah County going north to Salt Lake County grew by 126%. Though increasing numbers of commuters are traveling south to Utah County, the total trips into Salt Lake County still outnumber those commuting to Utah County two to one.

The majority of these inter-county commutes exceed 40 miles in each direction. They contribute to a large portion of the regions annual vehicle travel and thus air quality problems. Further, these long trips are costly to the travelers and contribute to congestion. As the north end of Utah County and the south end of Salt Lake County continue to develop, these longer trips will slowly diminish.

MODE SPLIT

The 2000 Census summarized the work trip mode split and they are listed on the Mode Split 2000 Census table. The Inter-Regional Corridor Alternative Analysis looked at only three of the different modes of travel for 2030; Drive alone, Carpool, and Transit and those projections are on the Inter County Mode Split 2030 table. The projected travel changes could come about as a result of improvements listed in the Long Range Plan and other socio-economic trends of the region.

MODE SPLIT 2000 CENSUS

Mode	2000 Percent
Drive Alone	72.5%
Car Pool	14.9%
Transit	1.4%
Walk	4.9%
Work at Home (*Telecommuting*)	5.0%
Other	1.3%

Source: Census 2000

INTER COUNTY MODE SPLIT 2030

Mode	2030 Percent
Drive Alone	62%
Carpool in I-15 HOV Lanes	26%
Transit	12%

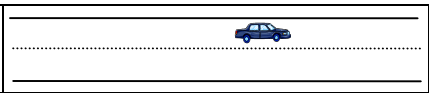
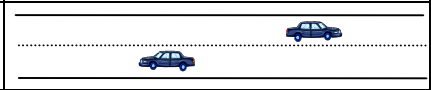
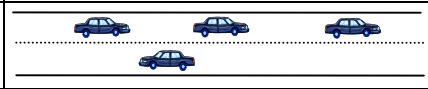
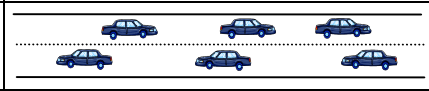
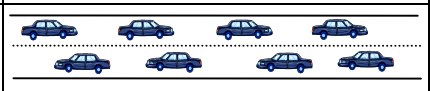
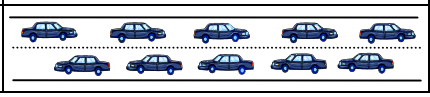
Source: IRCAA Study

LEVELS-OF-SERVICE POLICY

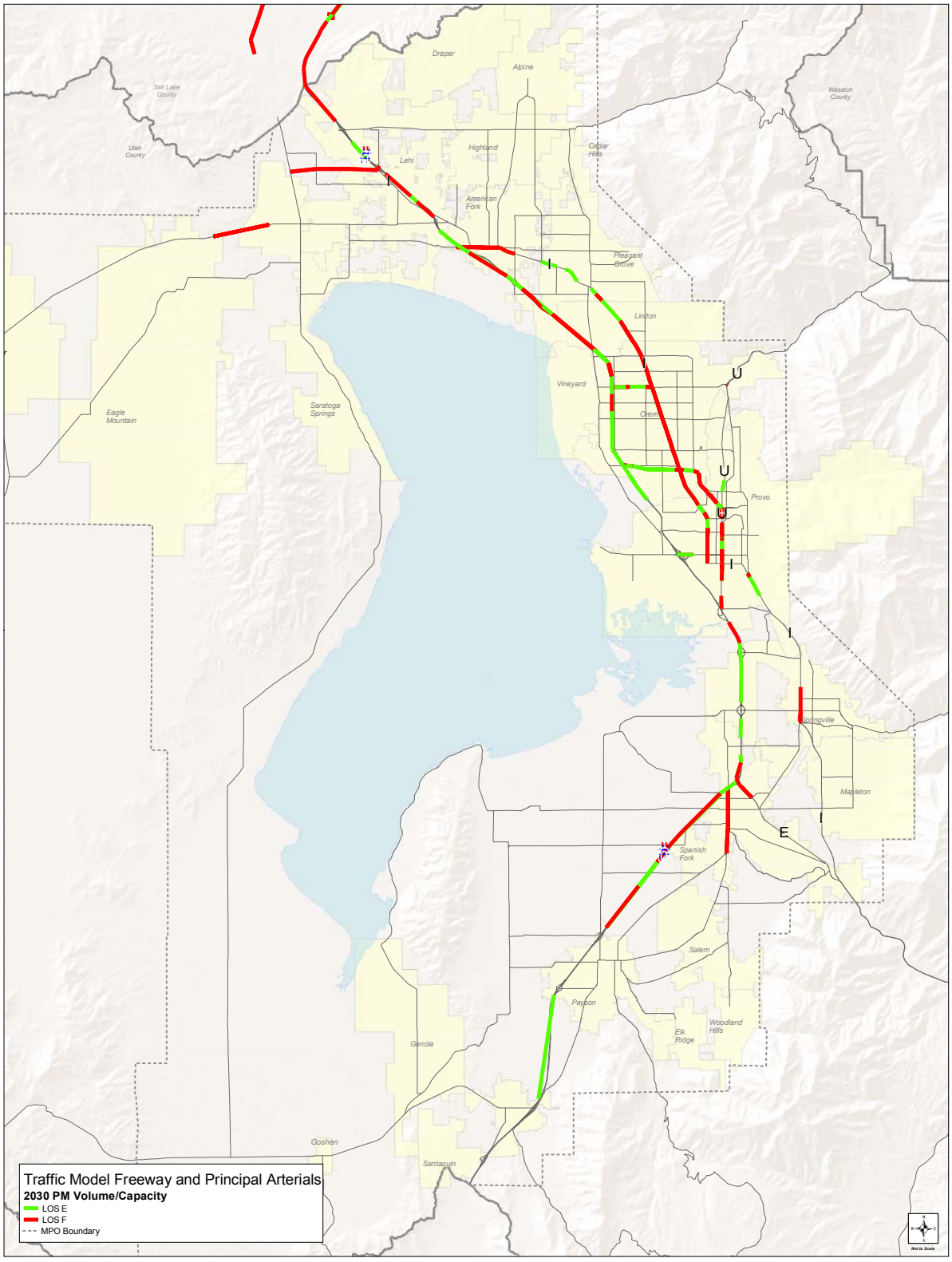
Over the years the Transportation Research Board of the National Academy of Science has devised a qualitative method of describing the ease, comfort, and convenience that a driver of a vehicle experiences along a street or highway. This method of description is called ***Level-of-Service***.

- ***Level-of-Service A:*** Describes free-flow operations at average travel speeds usually about 90% of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.
- ***Level-of-Service B:*** Represents reasonably unimpeded operations at average travel speeds usually about 70% of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.
- ***Level-of-Service C:*** Represents stable operations. However, ability to maneuver and change lanes in mid-block locations may be more restricted than in Level of Service B, and longer queues and/or adverse signal coordination may contribute to lower average travel speeds of about 50% of the average free flow speed for the arterial class. Motorists will experience an appreciable tension while driving.
- ***Level-of-Service D:*** Borders on a range on which small increases in flow may cause substantial increases in approach delay, hence decreases in arterial speed. This may be due to adverse signal progression, inappropriate signal timing, high volumes or some combination of these. Average travel speeds are about 40% of free flow speed.
- ***Level-of-Service E:*** Is characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination or adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.
- ***Level-of-Service F:*** Characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely critical at signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.

The level-of-service set as a goal for the transportation plan is a balance between convenience and cost. Our elected officials have adopted a policy of designing for a ***Level-of-Service D***, for the 30-year horizon, in view of the funding available.

LEVEL-OF-SERVICE		DESCRIPTION
A		**FREE FLOW.** Low volumes and not delays
B		**STABLE FLOW.** Speeds restricted by travel conditions, minor delays
C		**STABLE FLOW.** Speeds and maneuverability closely controlled due to higher volumes.
D		**STABLE FLOWS.** Speeds considerably affected by change in operation conditions. High density traffic restricts maneuverability, volume near capacity.
E		**UNSTABLE FLOW.** Low speeds, considerable delay, volume at over slightly over capacity**.**
F		**FORCED FLOW.** Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic.

LEVELS-OF-SERVICE 2030
UTAH COUNTY



MOUNTAINLAND PLANNING PROCESS

LONG RANGE TRANSPORTATION PLAN

A long range plan for each metropolitan area is prepared and updated every three years. The long range plan must identify transportation facilities (including multi modal and intermodal facilities) that function as an integrated transportation system; include a financial plan; assess capital investment and other measures necessary to preserve the existing transportation system; make the most efficient use of existing transportation facilities to relieve congestion; and must indicate appropriate transportation enhancement activities.

Federal transportation funding, in non-attainment or maintenance areas, is predicated upon demonstrating that the Long Range Transportation plan meets the transportation conformity requirements of the Clean Air Act (CAA) as set forth in the transportation conformity rule - 40 CFR, Parts 51 and 93, as amended by 62 FR 43780, Aug. 15, 1997. In addition, the TEA-21 sets forth metropolitan planning provisions that reinforce and complement the CAA conformity provisions. To meet the requirements, MPOs must explicitly show that the anticipated emissions resulting from implementation of transportation plans, programs, and projects are consistent with and conform to the purpose of the State Implementation Plan (SIP) for air quality

All of the sections of this document have been updated using the current data available with a planning horizon exceeding 20 years (to 2030). Horizon years were selected at ten-year increments using the Utah State Governor's Office of Planning and Budget's population, housing, and employment. The horizon years are 2010, 2020, and 2030.

The Long Range Plan includes references to the TEA 21 guidelines and embodies them philosophically as well as technically. We have been pro-active in public involvement at all steps in the planning process. The concept of intermodalism is considered in all sections and throughout the process. In addition, the impacts to the social, aesthetic, economic, energy, and environmental aspects of our communities from transportation facilities is considered, discussed, and embodied in the decision making process. The final Long Range Plan is only a summary of the in-depth planning, which has taken place and will serve as a milestone for future planning efforts.

GOALS FOR THE LONG RANGE TRANSPORTATION PLAN

The Long Range Plan is structured to provide a future transportation system that minimizes congestion, while addressing the environmental, social, and financial concerns of Utah Valley by integrating the local goals with the federal guidelines. The transportation system has been evaluated for levels of congestion. The following objectives have been addressed throughout the Long Range Plan. These objectives incorporate the goals of the Utah Valley Regional Planning Committee and will assure compliance with federal guidelines.

1. **Funding:** Funding for new capacity transportation projects comes from several sources. Consideration should be given to projects that include all or part of their funding from local sources or allocations from Congress or the State Legislature.

2. **Reconstruction and Preservation of Existing Facilities:** Preservation of the existing facilities has risen to become one of the primary concerns of elected officials and technical staff in the past few years. The rising costs associated with building new roads and reconstructing the aging infrastructure makes preservation a fiscally wise course of action. Proposed projects which include preservation of existing roadways have been given a higher priority throughout the funding decision making process.

3. **Improve the non-motorized transportation system:** Implement a long range non-motorized transportation system which links residential areas with major destinations, such as schools, shopping, employment, and services. This system connects to the transit system so that longer trips can

be taken from walking or biking to the bus. This will enhance access to major destinations, relieve congestion, and improve air quality.

4. Minimize air pollution: Forecasts of future emissions were calculated to allow for the evaluation of how well each alternative reduced pollution. The air quality standards established by the 1990 Clean Air Act Amendment were the standards each was attempting to meet. The Transportation Control Measures developed in 1993 for the State Implementation Plan were adopted as a base list of measures to apply in corridors where capacity increasing projects are proposed.

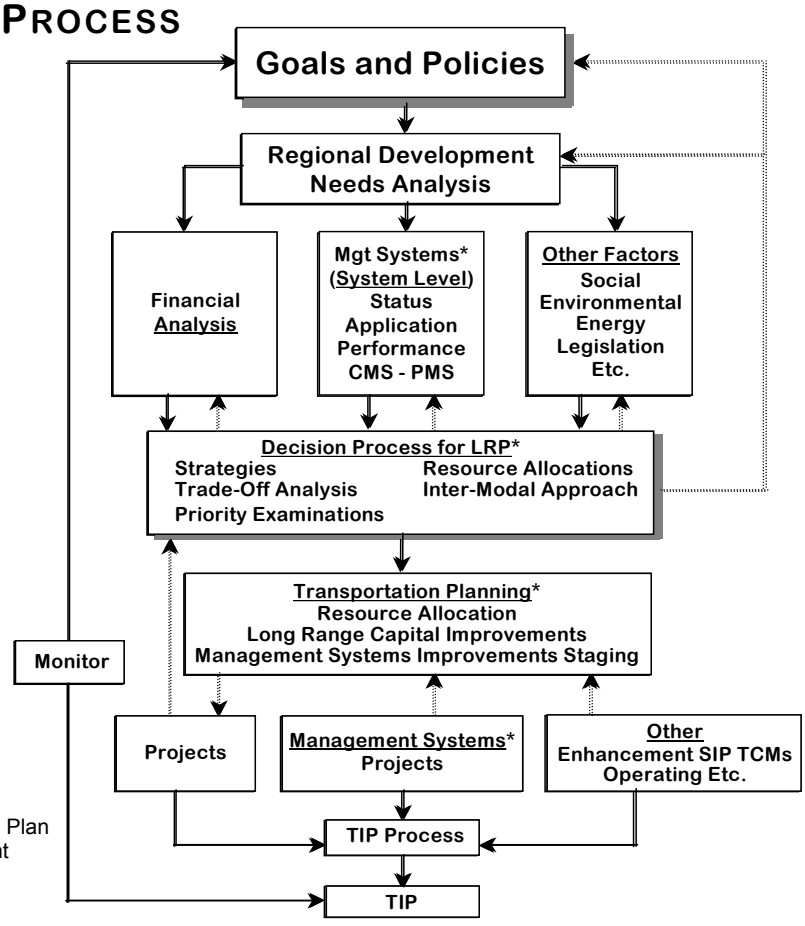
5. Maximize accessibility to important services: This objective is also related to reducing congestion and minimizing travel times. For each alternative, the distribution of travel times between important residential and employment centers was studied to ensure that major centers are well served by roadways and transit.

6. Coordinate all transportation elements into an intermodal system: In developing the Long Range Plan, a major objective was to develop a coordinated intermodal system of highway and transit improvements to meet the transportation needs of the area. A subjective evaluation of how well the highway and transit alternatives interacted was made. Projects that are intermodal in nature were given added priority ranking.

7. Develop a long range plan consistent with land use master plans: Transportation facilities need to serve the land use patterns of the area and must fit in with the character of development in each local area. In order to ensure that the Long Range Plan was consistent with local master plans, each city and the county was contacted to obtain their current and projected future zoning. This information was used to ensure that the transportation plan adequately matches the future land uses in the urban area.

LONG RANGE PLANNING PROCESS

The Utah Valley Long Range Planning Process chart follows the Goals and Policies involved with the planning process. Goals guide the technical analysis leading to planning documents, which are approved by the MPO policy-making committee. These plans in turn guide financial decisions, hence implementation of transportation facilities and programs. The chart illustrates how the MPO policy committee approves the goals and policies.



* Includes CMS (Congested Management System)
LRP Long Range Transportation Plan
TIP Transportation Improvement Program

TRANSPORTATION AND LAND USE PLANNING

Mountainland staff has merged the land use plans of its member agencies into a single general land use plan. A general land use data set was created showing 13 different land use types that correspond with the cities' current general plans. The description follows:

1. A compilation of generalized and future land use was made for the MPO area. This compilation required the involvement of all of the specific cities within the MPO area. First the existing zoning maps from all of the cities were compiled. Once the data was gathered it was combined within ARC/INFO, a Geographic Information System mapping system. This system facilitated the display as well as the database building process involved in this study. Once the generalized land use map was completed it was combined with existing population data. The combination of these two coverages allowed us to calculate the existing population density within each land use type. This number is used as the base land use layer.

2. To project future land use each city's 20-year general plan was used to create map coverage depicting future land use for the MPO area. This map was used to project the location of population and employment and is used by the travel model to predict future transportation needs.

Mountainland staff has established relationships with the planning commissions and staffs in the county and cities in order to facilitate improved transportation/land use coordination. Land use plans will continue to be reviewed and evaluated for their long-term implications to the future transportation system of the area. Zoning ordinances and their specific provisions will be reviewed to determine their impact on the transportation network. Changes to zoning and ordinances may be suggested to improve the efficiency of the transportation network.

Zoning and development requirements directly determine the nature of development of the area's transportation network; a Development Review Process is needed for each city to reduce the adverse traffic impact of large developments on the street system. New large developments should be encouraged to incorporate transit and carpooling amenities into their request for approval. Alterative land use scenarios may be proposed that would require evaluation by the travel model to determine their effect on future travel patterns.

PUBLIC INVOLVEMENT PROGRAM

Mountainland works to inform the public of its programs and planning and has incorporated public input into all planning activities. This includes involvement in the early stages of plan development and continuing throughout the update process. Citizens, affected public agencies, transportation agencies, private providers of transportation, and other interested parties can and make comment on proposed plans. Without the involvement of the local citizens, it is difficult to design a transportation program that effectively meets the needs of the public.

Participation from government, business, organizations, minority groups, special interest groups, and citizens of Utah County are sought when selecting and planning transportation projects and setting objectives. Mountainland solicits public participation and integrates public concerns and suggestions throughout all planning processes.

Sponsoring agencies include public participation in transportation project planning and selection before projects are added to any Mountainland document. Cities, county, citizen groups or private entities requesting projects for inclusion in the Mountainland Transportation Improvement Program supply a description of their public participation process followed in the planning of their project.

Long range planning issues, transportation projects, and matters related to federal transportation funds are presented and discussed in the monthly Utah Valley Regional Planning and Technical Advisory Committee meetings.

An Open House is held annually with UDOT, UTA, UDAQ, and the communities in Utah County. All those participating display their current and future plans including the Long Range Transportation Plan. MPO staff, city mayors, and city staff members are available to answer questions and take comments.

Over 1,700 names of individuals who have expressed an interest or participated in transportation planning comprise the Mountainland mailing list. Staff is also starting to compile a list of email addresses for use in conjunction with the mailing list. This list includes known minority groups, businesses, and publications, neighborhood groups, environmental groups, and local / state government officials and representatives. Post cards in English or Spanish are mailed to all on the mailing list inviting them open houses or public meetings. News releases and flyers announcing open houses and public hearings are also written in English and Spanish. A staff member provides Spanish translation at open houses and public meetings. A public hearing or open house is held prior to final approval for the Long Range Plan, Air Quality Conformity Analysis, and Transportation Improvement Program.

1. **Plans and Documents:** Draft copies of the Long Range Plan and Transportation Improvement Program are available for public review at least 30 days before finalization. If significant changes result from the public comments and suggestions received, a new draft document is issued and another 30-day comment period is initiated. All other major documents have a 30-day public comment period with an additional 30 days if necessary. The public comment period for an amendment or revision to an already approved document will be 30-days with an additional 30 days if necessary.

   Copies of all draft plans are available through Mountainland's office, the Mountainland website and for copying at local copy stores. When plans are ready for public review and comment Legal Notices and news articles are put in all major newspapers. All reports and documents are provided in Spanish upon request. Mountainland records and incorporates public comments into all final plans. All people making comments are sent follow-up letters and copies of any changes. Their names are added to our mailing list for receipt of notices of future planning activities and plans.

2. **Committee and Staff Participation:** Mountainland's staff is involved in community-based committees where transportation issues are discussed. Mountainland staff members help in the public participation processes associated with these committees. Mountainland staff members also make presentations to city and county planning commissions, local area Chambers of Commerce, and local public officials on planning activities. Staff members write and publish annual reports, informational newsletters, brochures, and questionnaires about transportation planning issues from a regional perspective.

   - *Utah Valley Regional Planning Committee Meeting:* Includes the mayors in Utah County, a Utah County Commissioner, a Utah State Transportation Commissioner, a Utah Transit Authority Board Member, a Utah Air Quality Board Member, and representatives from various state and federal agencies. This committee meets once a month and is always open to the public.

   - *Utah Valley Technical Advisory Committee:* Includes technical staff of all the participating jurisdictions and agencies. They meet monthly and meetings are open to the public.

   - *Congestion Management Committee:* This committee is a sub-committee to the Utah Valley Technical Advisory Committee and will meet when needed. They will evaluate road projects using congestion strategies.

   - *Utah Valley Trail Public Advisory Committee:* Meets regularly to discuss bike, trail, and pedestrian issues.

   - *Transportation Improvement Program Selection Committee:* Recommends and updates the

Transportation Improvement Program and meets 2 times a year.

- *Regional Growth Committee:* This committee will be established to address land use issues. Elected officials, community planners, and other interested parties will be asked to participate.

- *Public Advisory Committees:* These committees are comprised of interested people who either volunteer or are appointed by local elected officials. A Public Advisory Committee is established for every special study. These committees are instrumental in planning activities and will be used to develop future projects and studies.

AIR QUALITY AND TRANSPORTATION CONFORMITY

Federal funding and approvals for transportation improvement projects in urban areas are required to be part of the planning process involving all affected local governments. The process is documented through Mountainland's Long Range Plan and the 5-year Transportation Improvement Program. Since the passage of The Transportation Equity Act for the 21st Century (TEA-21) and the 1990 Clean Air Act Amendments, MPOs like Mountainland are required to comply with the requirements of these acts. The Long Range Plan and Transportation Improvement Program should conform to the State Implementation Plan for air quality.

Utah County is designated as moderate non-attainment for PM_{10}. Provo City is designated as moderate non-attainment for Carbon Monoxide.

Conformity rules outline specific analysis requirements that non-attainment areas must follow depending on the severity of the non-attainment problem and the time frame established by the Clean Air Act to develop and implement plans to correct the air quality problem. These rules require Mountainland to show air quality conformity for the life of the Long Range Plan, which is to the year 2030.

A detailed discussion of the analysis employed in the conformity determination is contained in a separate document entitled Conformity Determination for the Utah Valley Long Range Transportation Plan 2003-2030.

Based on the analysis consistent with these rules, a positive determination can be made for the Long Range Plan for the Utah County PM_{10} non-attainment area and for the Provo carbon monoxide non-attainment area

APPLICABLE CLEAN AIR ACT REQUIREMENTS AND CONFORMITY RULES

The Transportation Equity Act for the 21st Century and the relevant elements of the 1990 CAAA Subsections 176(c)(1)(2) and (3), requires the MPO to develop a long range regional transportation plan that conforms with the applicable State Implementation Plan (SIP) for air quality.

The EPA Transportation Conformity Rules (40 CFR Part 93) and FHWA/FTA Metropolitan Planning Regulation (23 CFR Part 450) were employed in the preparation of this conforming Long Range Plan.

The following list describes the appropriate subsections of 40 CFR part 93 the plan must meet:

- 93.110 –Latest Planning Assumptions
- 93.111 – Latest Emission Model
- 93.112 – Consultation
- 93.113(b) – Transportation Control Measures
- 93.118 or 93.119 – Emission Budget(s) or Emission Reduction

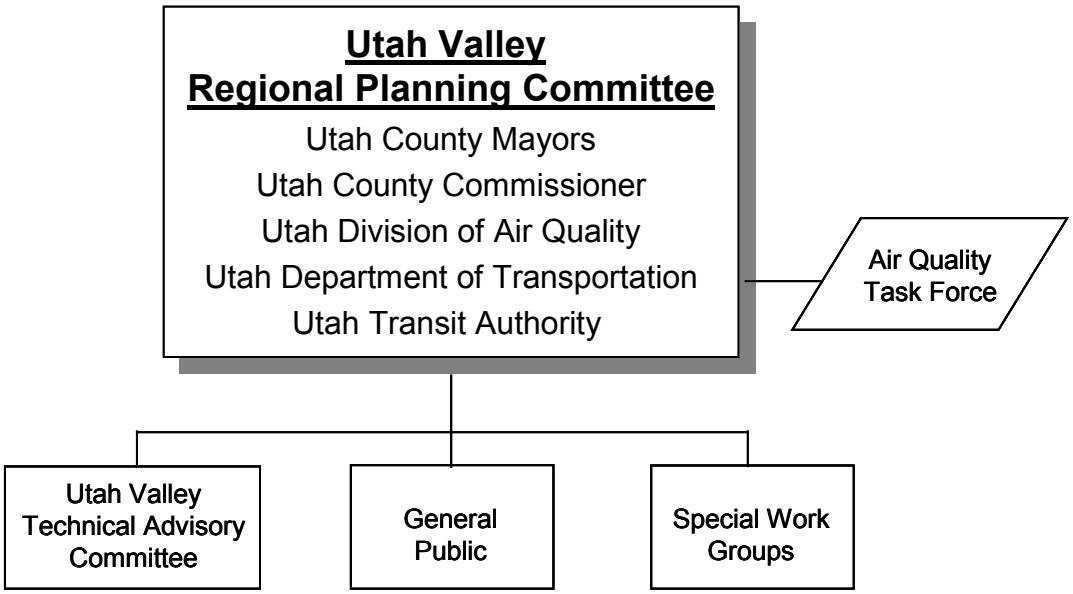
COORDINATION WITH CLEAN AIR AGENCIES

As stated in TEA 21, "In metropolitan areas which are non-attainment for ozone or carbon monoxide under the Clean Air Act, the metropolitan planning organization shall coordinate the development of a long range plan with the process for development of the transportation control measures of the State Implementation plans required by the Clean Air Act." A Memorandum of Understanding has been established between UDOT, Utah Division of Air Quality (UDAQ), and Mountainland to be followed by a Conformity State Implementation Plan.

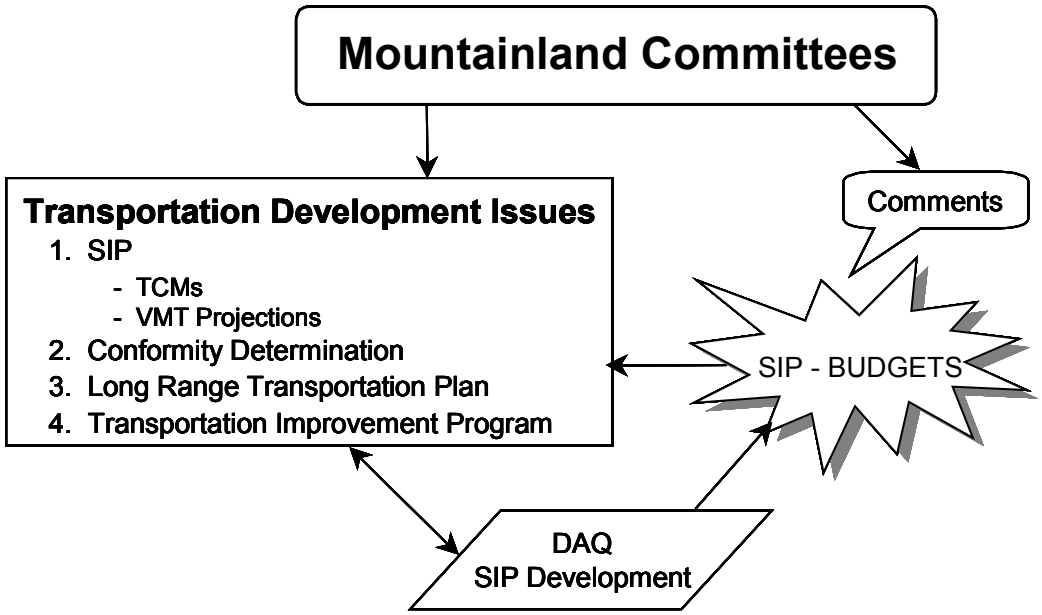
The Utah Valley Regional Planning Committee and UDAQ have agreed upon a new committee structure for making air quality policy decisions for the region's transportation plans. The following charts depict this committee structure and the consultation process, which has been approved by the Mountainland Association of Government's Executive Council.

The presence of UDAQ on the Utah Valley Regional Planning and Technical Advisory Committees has greatly improved communications between Air Quality and Transportation Planning activities. In conjunction with the conformity determination we have established an Interagency Coordination Committee that includes representatives of FHWA, UDOT, UDAQ, EPA, Mountainland, and WFRC. These meetings have improved the consultation process resulting in a successful plan consistent with the federal planning regulations and the SIP.

AIR QUALITY POLICY STRUCTURE



CONSULTATION PROCESS



TRANSPORTATION SYSTEM ANALYSIS

TRANSPORTATION SYSTEM

Analyzing the transportation system is a major component of the transportation planning process. Many activities are conducted to weigh and balance the transportation system as a whole. Most of the long range planning outputs are generated from modeling, monitoring current congestion conditions, planning alternative modes of transportation, and coordinating the connectivity of all the elements of the transportation system. A high level of the work is coordinated between Mountainland, UDOT, UTA, and the municipalities to facilitate a comprehensive planning process. This section lists the activities involved in planning and lists the current facilities that are in place today.

AIR TRANSPORTATION

A good system of airports is needed in the region to promote economic development and to serve the needs for movement of both goods and people. In 1987, the Wasatch Front Regional Council and Mountainland completed the Metropolitan Airports System Plan for the Greater Wasatch Region. The purpose of this plan was to inventory existing and projected aviation activities. The Metropolitan Airports System Plan was developed for airport capacity and airspace use patterns to meet the needs generated by the expected population and economic growth. An update of the system was completed and approved in May 1993 and currently is being re-evaluated by the MPOs and UDOT.

HIGHWAY ACCESS TO AIRPORTS

The objective of the Long Range Plan regarding air transportation is to provide good airport access for efficient operation. The following list provides current airport access:

1. An ongoing study entitled the I-15 Corridor Management Plan was completed in July 2002 suggesting new and additional westside access to the Provo Municipal Airport via either a new interchange at 1120 South or a collector distributor system which would provide multiple ingress-egress to I-15 between the University Parkway Interchange and 1120 South in Provo. The present access to the airport from Provo's Center Street with a mainline connection at I-15 will continue to be the primary access. Additional connections could be available as envisioned in the I-15 Corridor Management Plan or when additional alternatives are evaluated for feasibility and functional classification by UDOT.

2. Ground transportation to Spanish Fork/Springville Airport continues to be from Spanish Fork's Main Street, with a connection to I-15 and also at Springville's 400 South (SR-77) which also connects to I-15.

3. Ground transportation access to the Cedar Valley Airport is Airport Road, which connects to SR-73. Access to the Eagle Mountain Airport (Jake Garn Airport) is Sweet Water Road, which connects to SR-73 via the Eagle Mountain Road. SR-73 connects to I-15 in Lehi. The Jake Garn Airport is recognized by the state aeronautics division as a private airport, open to the public

PROVO MUNICIPAL AIRPORT

Provo City adopted the Airport Master Plan update to assess the existing and future role of the Provo Municipal Airport. The study identified, analyzed and documented various alternatives and recommends a course of action over a period of 20 years. The goal is to meet general aviation, potential commercial

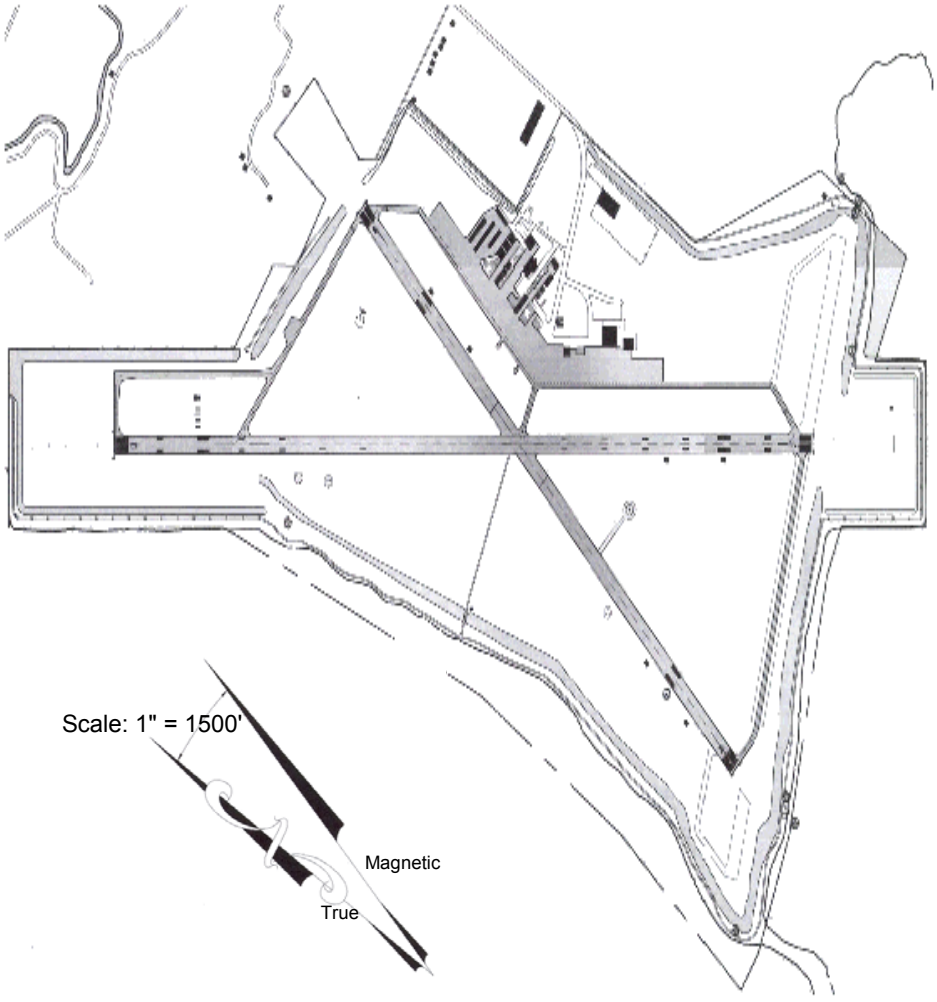
service, air cargo demand levels, and safety requirements in accordance with Federal Aviation Administration airport design standards. Provo Airport has two fixed base operators on the field:

Advantage Air and Millionaire, both of which have fuel concessions and flight services. In addition, Utah Valley State College operates a flight school with 26 aircraft including two of which are twin engine. They conduct training flights between 7 a.m. and 10 p.m. with 60 instructors. Currently they have 450 active student pilots and additional 550 students enrolled in various stages of the flight program. It is anticipated that they will expand their aircraft fleet to 30 aircraft and the number of students will remain about the same.

Air Cargo service was also considered in the Airport Master Plan. Examination of the factors contributing to the provision of air cargo services are the area's economic and business markets and location of manufacturing centers, which suggest that opportunities exist for such services at the Provo Airport.

The Provo area has many businesses that own and use their own planes. There are also private individuals owning small general aviation aircraft used for pleasure. The Provo Airport supports these activities by providing airside and landside facilities. Additional facilities will be required to continue to meet this growing demand.

PROVO MUNICIPAL AIRPORT



1. Air Traffic Activity: There are currently 165 based aircraft at the Airport consisting of 124 single-engine aircraft, 23 twin-engine aircraft, and 3 business jets. Air cargo activity is also conducted at the Airport by a variety of small operators, averaging some 75,000 takeoffs and landings annually.

Rocky Mountain Helicopter is based at the airport and has a large facility which does contract maintenance work for companies all over the U.S. and in foreign markets. They do not base helicopters at the Provo Airport, but at any time have several in their maintenance bays for servicing.

2. Existing Airfield Facilities: The existing airfield facilities at Provo Municipal Airport include runways, taxiways, aircraft parking aprons, navigational aids, and airfield lighting. During the 2002 Winter Olympics, Airport Surveillance Radar and air traffic control were added to the Provo Municipal Airport. A temporary control tower was installed to facilitate air traffic operations during the Olympic. Partial funding has recently been approved by the FAA to construct a permanent tower, which will be built as soon as additional funds are appropriated by Provo City or the State of Utah. A control tower will be needed before future air carrier operation can commerce at the Provo Municipal Airport. A temporary radar site was also installed for the Olympic and Air Traffic Control recommended the site become permanent. However, the site was removed at the close of the Olympics and there are no current plans to reinstate it.

PROVO AIRPORT MASRTERPLAN
SUMMARY OF DEMAND / CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

AIRSIDE			
	Existing (2002)	Required (2020)	Need (2020)
EXISTING RUNWAY (13-31)			
Length	8600'	8600'	
Width	150'	150'	
Existing Runway (18-36)			
Length	6602'	6602'	
Width	150'		
*Only if it is cost effective to reduce width			
Future Runway (13R-31L)			
Length		4,400	4,400
Width		75	75
Parallel Taxiway (13-31 and -13R-31L)			
Length	Partial	Full	Full
Width (13-31)	50'	50'	50'
Width (13R-31L)	New	35'	35'
Apron (Square Yards):	75,000	119,000	44,000
	Existing (2002)	Required (2020)	Need (2020)
New Terminal Building			
(sq. ft.)	5,000	5,000	16,000
Ultimate Terminal Building			
(sq. ft.)		93,800	93,800
Hangars			
Executive (sq. ft.)	175,000	247,900	72,900
T-style (sq.ft./spaces)	60,000/50	108,000/90	48,000/40
Fuels			
100 Low Lead (gals.)	36 k	36 k	0
Jet-A	30 k	40,000	10 k
Auto Parking			
No. Units	90	800	710

Data source: Airport Development Group Inc.

SPANISH FORK / SPRINGVILLE AIRPORT

The Spanish Fork/Springville Airport is a publicly owned basic utility airport. There are currently 85-based aircraft at the Airport. Principal activities include agricultural and recreational flying and aircraft maintenance. This airport is jointly owned and managed by the cities of Spanish Fork and Springville.

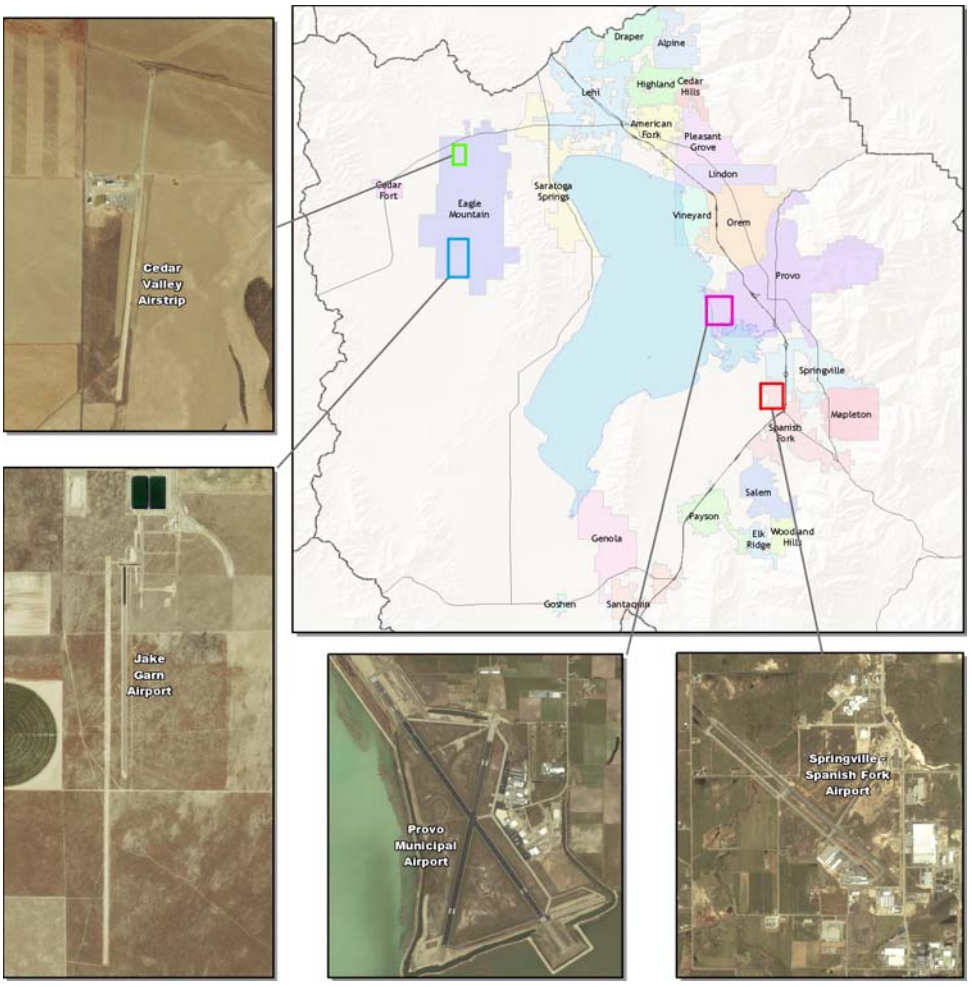
CEDAR VALLEY AIRSTRIP

The privately owned Cedar Valley airstrip is in the north west part of the County and is used mainly for recreation and training. There are currently 15-based aircraft at the airstrip.

EAGLE MOUNTAIN / JAKE GARN AIRSTRIP

This airstrip is presently in the development stage. The Jake Garn Airport is owned and operated by Eagle Mountain Properties L.C. It is an integral part of a new residential development intended to serve property owners that happen to be pilots with a taxiway from the home site to the hangar. The airport will feature a north-south runway of 6,150 x 75 feet, capable of serving aircraft from propeller to small business jets. The runways are specifically designed to minimize any impact on the natural beauty and serenity of the area, as well as providing the convenience and access that the people and businesses of a growing community require. Basic services, including fuel and hangar space will be built during the phase one development. A Fixed Base Operator terminal and corporate jet services will be available during Phase one. There are currently 3-based aircraft at the airstrip.

AIRPORT FACILITIES IN UTAH COUNTY



FUNCTIONAL CLASSIFIED ROAD SYSTEM

The roadways, highways, and freeway in Utah County are the main network of transporting people and goods and obtaining services and employment in the region. The Functional Classified Road System is the highway backbone of all urban regions. It consists of the Interstate, Principal Arterials, Minor Arterials, and Collectors. These roads are both own by the state and by local municipalities and the county. They include over 5,400 lane miles of pavement.

The 2000 US Census report illustrates the heavy reliance of highway travel in the county. The 2000 Census data for the different ways people use for commuting to work follows:

Mode used	
Drive Alone	72.5%
Carpool	14.9%
Transit	1.4%
Walked	4.9%
Other Means	1.3%
Worked at Home	5.0%.

Almost 89% of all work commutes are done in some fashion that requires travel on the highway system. This is not to mention all the other trips that are taken for daily activities not associated with work. Projects are set forth in this plan to lessen the amount of trips on the highway system, but it will always play a major factor in moving the traveling public.

The process to classify a road as functionally classified entails using technical information as well as logic assumptions. About every 3 years, UDOT, FHWA and Mountainland list suggestions for changes to the functional system. These changes include changing a class, adding new roads to the system, and in some cases, removing a road from the system. A field review of each proposed change is conducted and traffic, accident, and travel characteristics data are complied to support the proposed changed. This process usually takes 6 months.

Functional system criteria as related to travel characteristics include the trips served, areas served, and characteristics of the facilities themselves. Within this basic framework, specific measures can be identified as being particularly applicable in assigning facilities to predefined functional classes. For urban functional classification, the criteria measures deemed most useful include service to urban activity centers, system continuity, land use considerations, route spacing, trip length, traffic volume, and control of access. Naturally, none of these can be applied independently, or to the exclusion of all others, in developing functional systems. It is hoped that as many of these as are feasible will be considered in arriving at a logical functional classification.

Currently, Utah County has 347.5 miles of highways on the Functional Classified System. Of these highways, Principal Arterial account for 55.4 miles, Minor Arterials account for 61.4 miles, and Collectors account for 230.7 miles. These miles reflect the rural nature of Utah County prior to high growth years of the 1990's. Larger highway facilities have not been designated to keep up with the growth. This issue will be addressed in the near term with changes to the current system elevating collectors to arterials and proposing new arterial roads.

See Section 1 - Utah Valley Transportation Planning for the Functional Classified Road System-Urbanized Area and Utah County maps.

FREIGHT MOVEMENT

FREIGHT BY TRUCK

Salt Lake City is a junction between I-15 and I-80 and as such is a major transfer and warehousing center for a number of trucking firms. Utah County has a great deal of pass through truck traffic but is the destination for very few freight operations. There are 1500 trucking companies with fleets ranging from 1 to 25 trucks registered in Utah County. A single distribution center, Rayloc, is located in Payson and distributes auto parts.

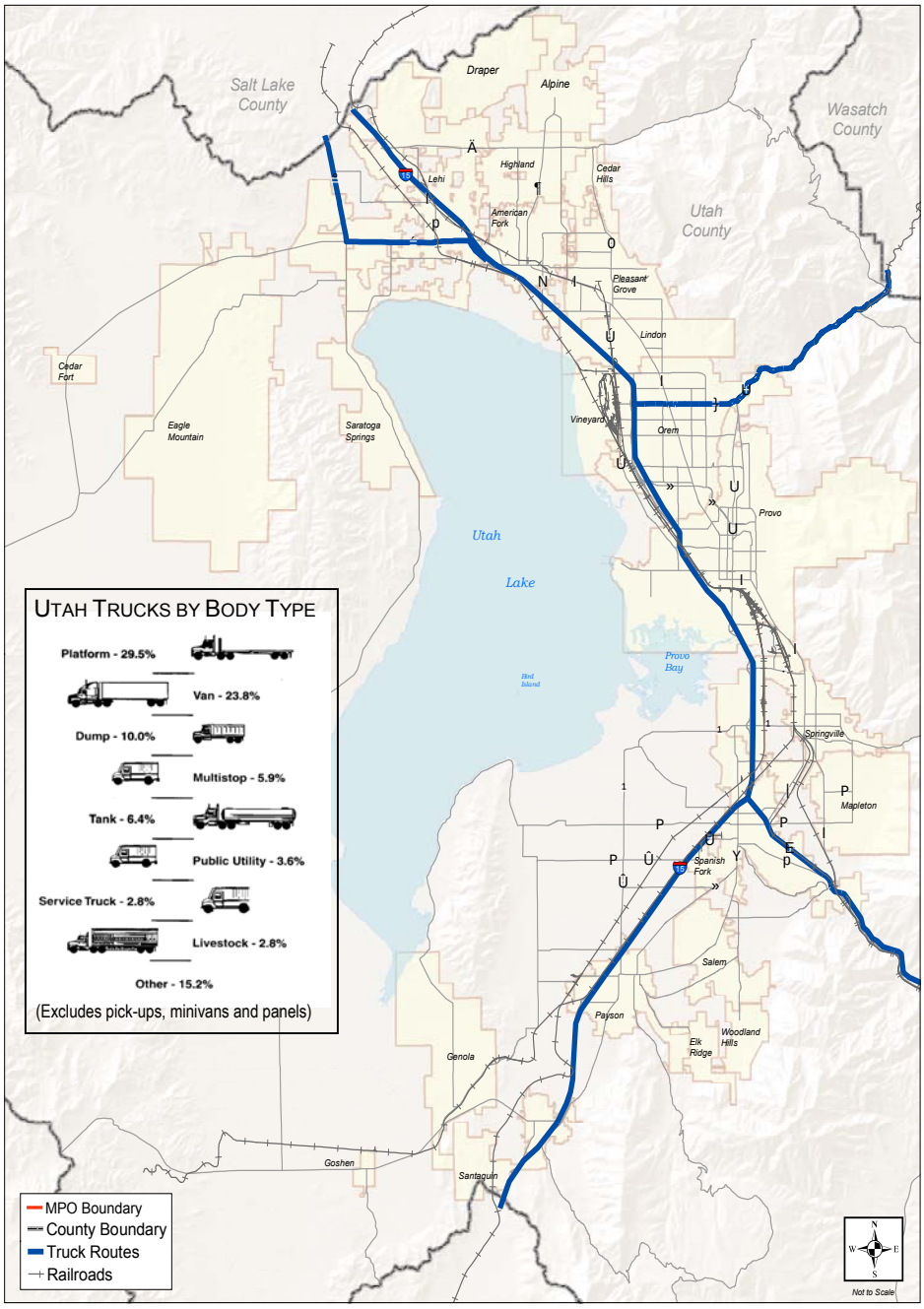
The primary freight responsibility is assuring smooth uninterrupted passing of freight through the region. I-15 and state routes are major freight facilities. These facilities are all included in our travel demand model and will receive attention in congestion management activities.

FREIGHT BY RAIL

The Union Pacific Railroad is a Class I railroad serving much of the western United States. It provides main line service through Utah County in a north-south direction and from the east through Spanish Fork Canyon. Among UP's other facilities in the area is a major switching yard in Provo.

Rail transportation also provides for the intercity movement of persons and goods in the region. Since most railroads are owned and operated by private companies, planning for rail transportation by public agencies is limited.

FREIGHT ROUTES



TRANSPORTATION DEMAND MODELING

A complex travel demand model called TP+ is used to project travel needs. The travel model uses population and employment projections to do this. These projections estimate how many people there will be in the metropolitan area; where they will live; and where they will work, shop, study, play, and worship through 2030. This information must be known and future travel desires estimated before the future transportation needs of the area can be determined.

TRANSPORTATION PLANNING MODEL

Computer simulation models have been used as part of the urban transportation planning process for the Utah Valley area since the late '60s. Mountainland currently employs an integrated travel model that is jointly developed and operated with WFRC. The model utilizes CitiLabs' TP+/Viper transportation modeling software and simulates a transportation network along the Wasatch Front from Brigham City to Santaquin.

In 1999 Mountainland and WFRC in cooperation with UTA, UDOT, and Governor's Office of Planning and Budget (GOPB) jointly undertook establishing an inter-regional travel model. The desire was to expand the traditional model to be more sensitive to both transit and non-motorized methods of travel. The three then independent models for the Ogden, Salt Lake, and Utah Valley areas were merged into a single integrated regional travel model. The model incorporates several enhancements to the traditional modeling approach. TP+ consists of a group of computer programs that perform the various steps of the modeling process illustrated below. A detailed description of the modeling process can be found in the model documentation report ***"Utah Inter-Regional Travel Demand Model Documentation."***

The data and modeling technology used in the needs assessment and air quality analysis associated with this Long Range Plan are the most current available at this time. The integrated travel model has been calibrated by successfully simulating the travel behavior of the people living in our valley as surveyed in the 1993 Origin and Destination Study. It has been validated through a systematic comparison of the model outputs to real world traffic counts from monitors placed in the streets by UDOT.

The outputs from our model are as accurate as the model input data and have been used to predict what future highway needs will be. Mountainland will be updating the databases annually, or as needed. The Long Range Plan will be updated in three years using the most current data available at that time.

DEVELOPMENT OF TRAVEL MODEL DATA

GOPB publishes population and household estimates and forecasts for each county in the State. They also provide future employment forecasts by county. Utah WorkForce Services annually provides detailed current employment data. Because a forecast's statistical error is smaller for a larger population than for a smaller one, GOPB's Utah County forecast were used as control totals. The area's census tract and Traffic Analysis Zone forecasts were then adjusted.

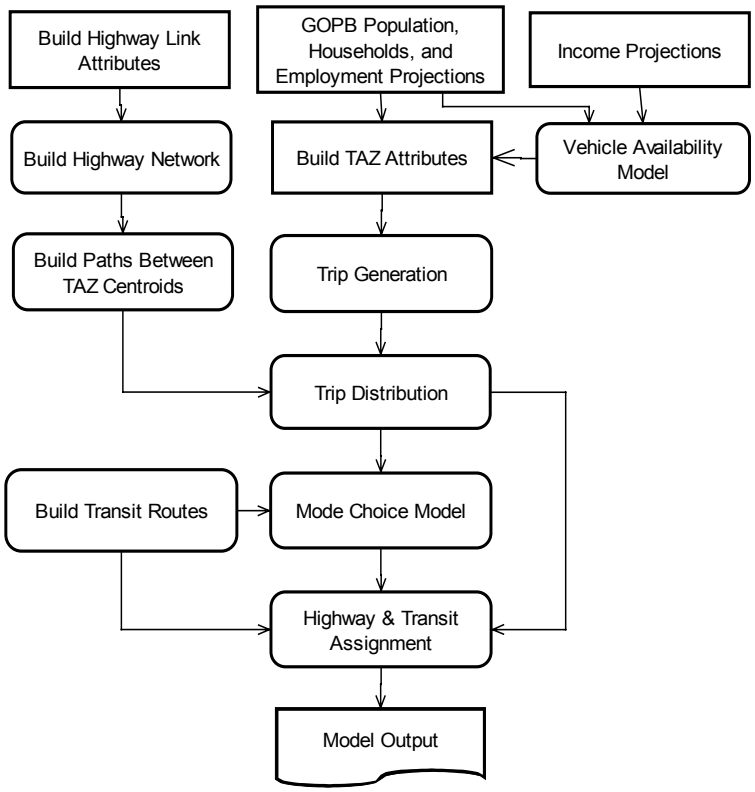
The spatial distribution of household and employment forecasts was carefully coordinated and corroborated with each of the area's local planning agencies. From this base, a generalized picture emerged of how the Utah Valley metropolitan area would develop by the year 2030.

Mountainland conducted an Origin and Destination Study in 1993, and those findings were used as a pattern for types and frequency of trips made in Utah County. The model assumes that people in 2030 will have the same kinds of travel needs, but their housing and destination locations will be changing with added development. Population and employment within a zone generate the trip productions and attractions.

SUMMARY OF HOW THE MODEL WORKS

1. Input Data Required by the Model: In order to provide a framework for describing and analyzing travel variables in the planning process, the existing streets, highways, and transit routes are generalized into a simulation network representing the freeways, arterials and collector streets of the region. (Local streets are not represented in the network.) The network can be displayed as thousands of individual links, each of which represents a particular street or highway segment. This will be discussed in greater detail in the "Building the Transportation Network" section.

TRANSPORTATION MODELING FLOW CHART



A spatial framework is also devised for describing and analyzing the land use and socio-economic variables used in the planning process, the study area was subdivided into small geographic units called Traffic Analysis Zones (TAZ).

Each TAZ was created in such a way that it wouldn't be split by a census tract boundary. Thus, each of the area's census tracts contains one or more TAZs. The Mountainland study area currently contains 349 TAZs. This level of TAZ structure better facilitates the modeling of transit and non-motorized travel. Earlier models had a sparcer TAZ structure and were more limited in their application. This will also be discussed in the "Build TAZ Database" section.

2. Build TAZ Database: The first step in the process is to aggregate population, household and employment data as attributes for each TAZ for the base model year and for each of the future model years. The vehicle availability component of the model develops the future household vehicle availability data projections.

As was mentioned earlier, household data has been stratified by (1) the number of persons per household and (2) by the number of vehicles used by the household. The model has a component that uses this data to calculate the expected number of person-trips for each ***household size/number of vehicles*** combination totals for each TAZ. This process is repeated for each trip purpose described in the section on trip generation.

3. Trip Generation: Next is to determine the number of daily trips that take place (or will take place at future intervals in the 27-year planning period). This procedure estimates the number of trips to and from each of the 349 TAZs in the study area.

Various trip purposes are modeled, for trips originating from home such as work, personal business, school, shopping, and other trips; and trips based in a location other than a home, such as lunch, shopping or freight delivery trips made from a work site are shown as non-home based trips. These trips are estimated using assumptions derived from the travel behavior of the people living in our valley as surveyed in the *1993 Origin and Destination Study*. These assumptions specify the number of trips typically made by each combination of household size and number of vehicles used by the household and each type of destination in the region. They use special factors to account for different rates of trip-making

that are characteristic for different parts of the region. These assumptions and special factors are included in the equations used to derive the trips for each of the 349 TAZ in Mountainland's study area. For example, a household of two people in downtown Provo with one car is assumed to make fewer shopping trips than a household of four or more in the suburbs with three cars. (In general, household size and the level of auto ownership have been found to be a good predictor of household trip rates.) In the trip generation procedure, each TAZ can be said to "produce" and "attract" trips. The trips "produced" are those that start in the TAZ. Residents' trips to and from work; their trips to and from shopping destinations; and other round trips made from their homes. The trips "attracted" by a TAZ are those ending in the TAZ. The destinations in the TAZ may be work sites, retail sites, and other destinations. Each trip is effectively "counted" twice in this step, once as a "production" and once as an "attraction."

A set of equations is used to estimate the number of trips produced by and attracted to each TAZ based on its residential and employment characteristics. These estimates rely on the actual or projected employment in the TAZ to determine how many workers and shoppers it attracts. The more employment a TAZ has, the more work trips it attracts. The more retail employees in a TAZ, the more shopping trips are assumed to be attracted there. These equations should produce modeled trips similar to actual travel determined in the Origin and Destination Study and road counts.

When the trip generation procedure is completed, we have an estimate of the trips produced and attracted to each TAZ. In "Trip Distribution" it describes how each trip produced in a particular TAZ is linked to a trip attracted in another TAZ.

BUILDING THE TRANSPORTATION NETWORK

A database is constructed containing the attributes of each of the highway and street segments included in the area's freeway, arterial, and collector street network. These attributes include such things as the length of the segment, the number of lanes, the capacity of each lane, the off-peak travel speed, etc. This data is then processed by the network-building program that creates a highway network structure that can be utilized by later stages of the modeling process.

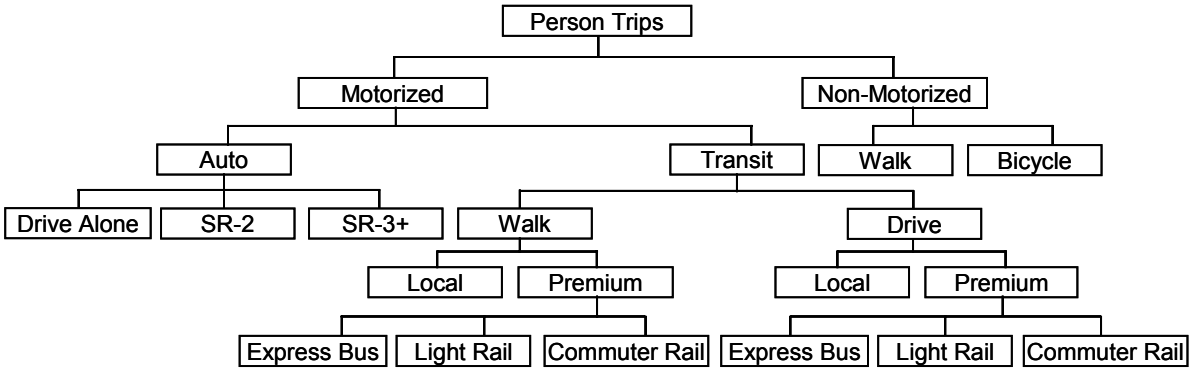
1. **Build Highway Paths Between TAZ:** Before trip productions and attractions can be matched up, a table of "optimum" travel paths from each TAZ to every other TAZ must be developed. The path building procedure analyzes each possible travel path until it finds the path with the shortest travel time between the two TAZ being analyzed.

2. **Trip Distribution:** The task of distributing the trips produced in each TAZ to each of the other TAZ which attract trips, is the work of the trip distribution. In this step the trips "produced" and those "attracted" are linked geographically into origin-destination pairs. Trip Tables are developed from the population, household and employment forecasts to determine the number of trips that would be made in the Utah Valley metropolitan area in 2030, and where the trips would begin and end, i.e. productions and attractions, from the trip generation step. For example, the number of work trips produced by a TAZ in Orem are matched with work trip attractions throughout the region to estimate the numbers commuting within Orem, to other nearby communities, such as Salt Lake County and elsewhere. The same process is used to estimate all possible pairs of TAZ in the region. (There are 40,000 possible pairs of beginning and ending trip ends.)

The modeling process for trip distribution relies on the general assumption that time spent in traveling is perceived negatively, the more distant the destination, the more objectionable the trip. Most of the trips produced in a given TAZ will be attracted to surrounding or nearby TAZ; some will be attracted to moderately distant TAZ; and very few will be attracted to very distant TAZ. (The effect of travel time in discouraging trips is more pronounced for non-work trips than for commute trips, where trips fall off less sharply with distance.) The number of employment opportunities represents not only work but also shopping and service availability. This availability increases the attractiveness of a destination as opportunity increases, thereby accounting for long trips, between counties for example. This general principle is translated into a mathematical procedure known as a "gravity model," with the effect of travel

time represented as a "friction factor." Once completed, this procedure yields a set of trip interchanges, a table of trips made from and to each TAZ in the region. Trip interchanges are produced for each trip type.

3. Mode Choice: This step of the process determines the probable mode of travel taken by each traveling individual--it is commonly referred to as **modal split**. The enhanced mode choice model developed follows the decision tree.



Members of the traveling public are assumed to choose from the transportation modes shown above for each trip. The model assumes that their choices are based on the relative availability and attractiveness of each mode. Factors considered in the attractiveness of the mode include:

- accessibility of mass transit
- automobile ownership
- costs required to use the mode
- time required to use the mode
- pedestrian friendliness

The cost variables represent "out of pocket" costs, including public transit fares, the price of gasoline, parking, and a mileage rate for driving. Time variables include time spent waiting for transit, time transferring between routes, or time spent driving and parking the car in order to reach the final destination. The mode choice factors are arrayed in an equation that estimates the probability of each traveler selecting each mode, given the characteristics of both the mode and the traveler.

4. Choice of Route: The final step in the simulation of travel behavior is to determine the route travelers choose to reach their destinations. This step, known as traffic assignment, tells us how many vehicles will travel on each of 1,680 road segments, known as links. To perform this step, the computer model selects the best "path" through the highway network for each type of trip, determining the shortest way both in terms of time and distance to get from zone to zone for each of the 1.89 million daily trips projected for the year 2030.

For accuracy, this "path building" process must take into account the actual capacities of the road segments and avoid "loading" more vehicles onto a route than could be realistically accommodate. This is accomplished by running successive iterations of the assignment module and adjusting the travel speed on each link according to the amount of "congestion" present. This procedure continues until all trips have been assigned. It simulates the effects of drivers selecting alternate routes to avoid congested roads.

5. Verification of Model Results: An important part of Mountainland's ongoing modeling effort is the verification of model results and testing model output against current conditions to ensure that the results are reasonable. In the verification process, the Mountainland staff compares the model's results for existing or previous years with all available data for the region, including actual traffic counts, public transit passenger counts, and other survey results. Data from special surveys are often employed in this step.

6. Model Applications: The model has a number of basic applications. These include travel forecasts and air quality assessments to support both long range planning and the development of the five-year Transportation Improvement Program. The model projects vehicle miles traveled for future years. The table includes Vehicle Miles Traveled projections for this Long Range Plan.

Year	Vehicle Miles of Travel
1996	6,733,700
2003	8,650,000
2010	10,300,000
2020	12,700,000
2030	16,600,000

In the plan's base year, 1996, better than 6,733,700 vehicle miles of travel were made on an average day in Utah Valley's metropolitan area. Future economic and population growth is projected to result in more travel for the area. When the projected traffic was assigned to the base year highway network, congested areas began to develop and grow worse over time.

Federal planning regulations require that the long range transportation plan span a time period of at least twenty years into the future. This plan covers a twenty-eight year period to the year 2030. General model simulations are performed for the years 2010, 2020 and 2030. Additional simulations are accomplished for the years 1996, 2000, 2003, 2005, 2008, 2011, and 2013 for air quality analyses purposes. Each simulation year requires new input databases that reflect hypothesized changes in network, land use, and socio-economic conditions from one analysis year to the next. The changes also reflect basic sets of assumptions, such as the following:

- Network assumptions are made about how different streets and highways or travel corridors will function over time–how their operating characteristics will change.
- Assumptions are made about the average number of daily person trips generated by each category of households that have been stratified by household size and the number of vehicles available[1] to them. These assumptions also vary by trip purpose, i.e. trips from home to work, from home to school, or from home for other purposes and trips that do not originate or end at a home.
- Assumptions are made about the location of employment throughout the study area for different categories of business and how it will change over time.
- Assumptions are made about how household income and other economic factors will change over time.

The integrated model is capable of providing decision makers with information pertinent to questions such as:

- What types of transportation investments will most improve future mobility in the region?
- Where is traffic congestion likely to appear?
- How will future levels of traffic congestion be affected by different land use and development scenarios?
- How many people could use public transit or car and van pools for their trip to work?

MONITORING (CHECKS AND BALANCES)

There are many opportunities for errors to creep in and amplify over time when forecasts are made for as many variables as were used in the metropolitan area's long range transportation planning. A surveillance program is designed to quickly identify deviations from the forecasts and evaluate their effects on long range transportation needs.

1 The forecasting of household vehicle availability for future years has become a particularly vexing task. As a result, the development of a vehicle availability model was included as part of the work scope for the Michael Baker Jr. contract, described in the next section, to develop the integrated travel mode. For a full description of the vehicle availability model see Technical Support Document No. 5.

Changes in population are received from the Utah Population Work Committee as well as employment information from the Utah's WorkForce Service, and land use data through inputs from local and county agencies throughout the study area.

Traffic counting programs from UDOT and local and county highway agencies provide current traffic information. Special surveys and studies, such as commuter parking are conducted as needed to acquire and monitor particular events.

When surveillance data show that actual changes are not following the forecasts, the area concerned can be evaluated to determine necessary action. Needed changes can then be made in the forecasts for future years and plan adjustments can be considered. Results of these surveillance programs are recorded and filed at Mountainland or UDOT.

It is the intent of Mountainland to carefully monitor and maintain forecast data sets; this will ensure the accuracy of modeling assumptions used to develop this plan. Under a new monitoring plan currently being developed, the staff of the MPO and its member agencies will compile appropriate tracking data.

FUTURE IMPROVEMENTS

Urban Sim, a land use forecasting model, will be used to forecast land use activity for the Greater Wasatch Area,[2] and is being developed for GOPB. Unfortunately, this model will not be operational for use in the development of this Long Range Transportation Plan. In the interim the Mountainland staff has analyzed the area's unique characteristics and using different land use scenarios with corresponding travel demand have developed a simplified, generalized set of forecasts to use with the TP+ model. In the future policy makers can receive information regarding land use decisions and travel implications.

2 The Greater Wasatch Area covers Box Elder, Weber, Davis, Tooele, Salt Lake, Utah, and Juab Counties

CONGESTION MANAGEMENT SYSTEM

CONGESTION MANAGEMENT SYSTEM REQUIREMENTS

The Congestion Management System is one of the management systems required by TEA-21. The goal of the Congestion Management System is to alleviate congestion[3] and enhance the mobility of persons and goods. This is done by:

- identifying congested roadways
- measuring the magnitude of congestion
- identifying strategies to reduce congestion
- implementing cost-effective actions
- performing follow-up studies to evaluate the effectiveness of the congestion-reducing actions

All existing roads where recurring congestion has developed or is expected to develop will go though the Congestion Management System process on a continuing basis. In addition, all federally funded projects in an air quality non-attainment area that will result in a significant increase in single-occupant-vehicle capacity[4] will go through the Congestion Management System process. In these areas, the strategies developed as part of the Congestion Management System shall be coordinated with the development of Transportation Control Management of the State Implementation Plan for air quality required under the provisions of the Clean Air Act.

CONGESTION MANAGEMENT SYSTEM PROCESS

Increasing single-occupant-vehicle capacity has been the historic de facto response to traffic congestion. In an era of growing congestion and limited resources, the Congestion Management System requires the consideration of other measures to help reduce traffic congestion. This process is outlined in the *Congestion Management System Process* flowchart.

When a sponsoring agency proposes a project that significantly adds vehicle capacity or is aimed at relieving recurring congestion, the project goes through an evaluation that determines the location and magnitude of the congestion in the area of the project. The Congestion Management System Committee uses this information to determine the project's merit based on congestion. If the roadway does not warrant a capacity increase based on congestion, then the project goes back to the sponsoring agency and another purpose and need would have to be identified. If a capacity increase seems to be warranted based on congestion, then the project is handed to the Congestion Management System Committee.

The Congestion Management System Committee evaluates the project, determines the possible causes of congestion, and identifies strategies to alleviate congestion and improve transportation efficiency. If congestion can be alleviated by the strategies alone, then these strategies will be proposed in place of the capacity-increasing project. Where additional general-purpose lanes are determined to be an appropriate strategy, congestion management strategies will be proposed along with the project. This is done to maintain the functional integrity of the additional lanes as well as to facilitate future demand management and operational improvements.

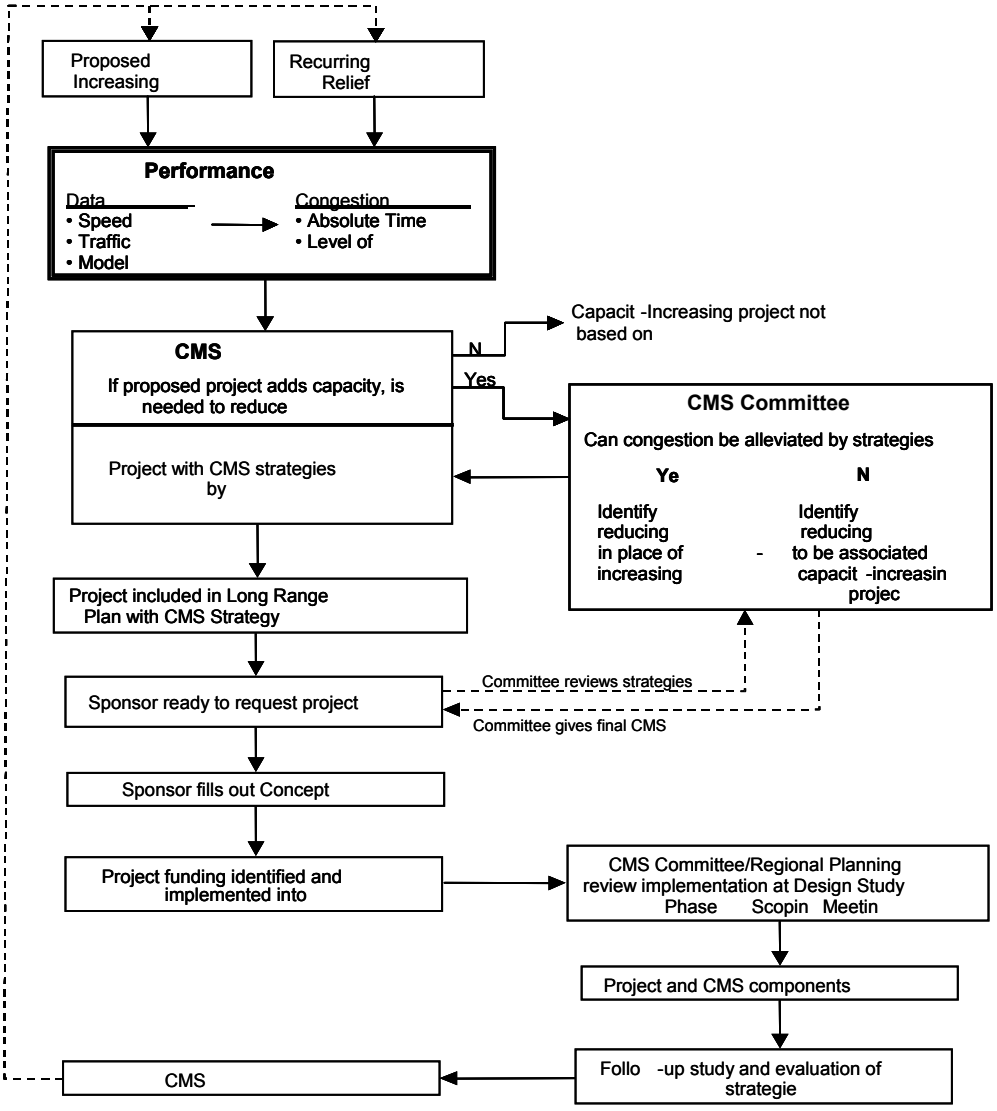
Once the committee has identified appropriate strategies, the project is handed to the Utah Valley Technical Advisory Committee for review and approval. The project along with the identified congestion management strategies is incorporated into the Long Range Plan in the appropriate horizon year.

3 Congestion is defined as the level at which transportation system performance is no longer acceptable due to traffic interference. The level of acceptable system performance may vary by type of transportation facility, geographic location, and/or time of day.

4 Adding general-purpose lanes to an existing highway or constructing a new highway constitute a significant increase in capacity for single-occupant-vehicles.

When the project is ready to be moved from the Long Range Plan into the Transportation Improvement Program, the Congestion Management System Committee once again reviews the project to validate the recommended strategies. This allows the committees to evaluate the project and congestion management strategies' validity in light of new technologies, construction and area wide transportation decision changes. After the review phase, the recommendations of the Congestion Management System Committees are considered part of the project and must be followed unless amended by the committee. The project sponsor then incorporates the identified congestion management recommendations into the Concept Report and shows how they are to be coordinated and implemented with the proposed project. Projects showing compliance with these recommended strategies would have preference for funding in the Transportation Improvement Program selection process. Once the project has had funding identified and placed on the Transportation Improvement Program, the Congestion Management System Committee and Mountainland staff shall help the project sponsor coordinate and implement congestion management strategies at the project scoping phase. It is the responsibility of the sponsoring agency and Project Manager to include Congestion Management System Committee representatives in these meetings.

CONGESTION MANAGEMENT SYSTEM PROCESS



After the project and the Congestion Management System components have been completed, follow-up studies are performed to determine how effective the project and strategies have been in identifying and relieving congestion.

These follow-up studies use the same performance measures in determining congestion-relief effectiveness as those used to originally identify and measure the congestion. The before-and-after results are then reported in the *Congestion Management System Plan for Utah Valley*.

PERFORMANCE EVALUATION

Performance evaluation is the heart of the Congestion Management process. It is used to:

- identify the congested areas
- measure the congestion
- rank the most congested areas
- identify the appropriate horizon year in which a project should be built
- compare the effectiveness of projects in reducing congestion

The performance evaluation phase has two parts, data collection and congestion measures.

1. **Data Collection:** The following data is needed to identify and measure congestion:
   - Average speeds on roadway facilities
   - Traffic volumes

Average speeds are obtained through speed runs performed by Mountainland staff using Global Positioning Satellite units and computer mapping software. UDOT and the individual cities provide current traffic volumes. Mountainland's travel demand model is used to determine future traffic volumes. Data collection is done on a continuous basis.

2. **Congestion Measures:** Measuring congestion is broken down into two steps, identifying the location of congestion and measuring the magnitude of congestion. In the first step, the Congestion Management System process uses Mountainland's travel demand model to identify the location of congested areas. The model gives a level-of-service for each roadway in the model network for a graduated set of years covering the life of the Long Range Plan. Roadways with a Level-of-Service of "F" are considered congested. Based on these model runs the location of congested areas and the horizon year the area will be congested are determined.

In the second step, *Absolute Time Delay* measures the magnitude of congestion. Absolute Time Delay is figured based on free-flow speed, congested speed, the length of the congested area, and the volume of vehicles impacted by the congestion. The equation used to calculate Absolute Time Delay is shown as follows:

$$AbsoluteTi\ meDelay\ (\text{sec}) = \left(\frac{1}{Congested\ \ Speed} - \frac{1}{FreeFlow\ \ Speed} \right) * Miles * ADT$$

$$where\ \ ADT = Average\ \ Daily\ \ Traffic$$

Congested areas identified by the model are further analyzed using the Absolute Time Delay equation. Areas with the worst congestion have the highest Absolute Time Delay value. The Congestion Management System committees use these values to rank the most congested areas. This ranking is used to determine the top priorities for projects in the Long Range Plan.

After a project and/or the identified Congestion Management System strategies are complete, periodic assessments are made to determine the effectiveness of implemented strategies in terms of the area's established performance measures. The results of this evaluation shall be given to decision makers to provide guidance on selection of effective strategies for future implementation.

CONGESTION MANAGEMENT SYSTEM COMMITTEE

The Congestion Management System Committee is comprised of the Utah Valley Technical Advisory Committee and Mountainland staff. The Utah Valley Technical Advisory Committee reviews and approves recommendations from the Congestion Management System Committee and can hand back to the committee projects that do not meet with their approval.

CONGESTED MANAGEMENT SYSTEM STRATEGIES

Congestion Management System strategies contribute to the more efficient use of existing and future transportation systems. For each strategy or combination of strategies proposed, an implementation schedule, responsibilities, and possible funding sources shall be identified.

The following is a list of Congestion Management System strategies from Federal Highway Association Register, 23 CFR 500.507:

1. *Transportation Demand Management Measures*: car pooling, van pooling, alternative work hours, telecommuting, and parking management.
2. *Traffic Operational Improvements*: intersection and roadway widening, channelization, traffic surveillance and control systems, motorist information systems, ramp metering, traffic control centers, and computerized signal systems.
3. *Measures to Encourage High Occupancy Vehicle Use*: High Occupancy Vehicle lanes, High Occupancy Vehicle ramp bypass lanes, guaranteed ride home programs, and employer trip reduction ordinances.
4. *Public Transit Capital Improvements*: exclusive rights-of-way (rail, busways, bus lanes), bus bypass ramps, park and ride and mode change facilities, and paratransit services.
5. *Public Transit Operational Improvements*: service enhancement or expansion, traffic signal preemption, fare reductions, and transit information systems.
6. *Measures to Encourage Use of Nontraditional Transportation Modes*: bicycle facilities, pedestrian facilities, and ferry service.
7. *Congestion Pricing*.
8. *Growth Management and Activity Center Strategies*.
9. *Access Management Techniques*.
10. *Incident Management*.
11. *Intelligent Vehicle-Highway Systems and Advanced Public Transportation System Technology*.
12. *Additional General Purpose Lanes*.

All capacity-increasing projects must show that all applicable strategies have been implemented or have been considered in the project scope before adding new capacity is warranted. Based on prioritized congested locations, identified strategies, and estimated funding, Mountainland staff with approval of the Congestion Management System Committee will develop a program and schedule for implementing recommended improvements.

INTELLIGENT TRANSPORTATION SYSTEM

The *Intelligent Transportation System*, or ITS, describes how technology, such as electronic traffic equipment, computers, and communication systems, is being used to make transportation safer, more environmentally friendly, and less congested. It encompasses a number of diverse programs including:

- Advanced Traffic Management Systems
- Advanced Traveler Information Systems
- Commercial Vehicle Operations
- Advanced Crash Avoidance Systems
- Automated Highway System
- Advanced Public Transportation Systems
- Advanced Rural Transportation Systems

Essentially, ITS improves the efficiency of the transportation system and helps those interested in traffic - technical staff as well as the general public—make the best decisions possible regarding traffic and transportation.

Utah's Intelligent Transportation System, *CommuterLink*, is funded, designed, and maintained by a coalition of federal, state, and local governments and the private sector. UDOT is the lead agency for ITS development in Utah. Mountainland and other agencies coordinate with UDOT in this effort. *CommuterLink* was first deployed region-wide in the Salt Lake Valley and is now expanding into Utah, Weber, and Davis Counties. Over time, UDOT intends to expand *CommuterLink* into a statewide system.

GOALS AND OBJECTIVES

Mountainland's ITS goals follow national and state goals set for ITS. These goals seek to improve the transportation system in the following ways:[5]

Goal 1: *Safety.* Reduce the number of crashes (including secondary crashes caused by slowing or queuing of traffic) for all types of vehicles, provide for faster response and recovery when crashes occur, and reduce the number of transportation related fatalities.

Goal 2: *Security.* Develop a secure transportation system that is well protected against attacks and can both detect and respond effectively and quickly to natural and manmade threats enabling the continued movement of people and goods in times of crisis.

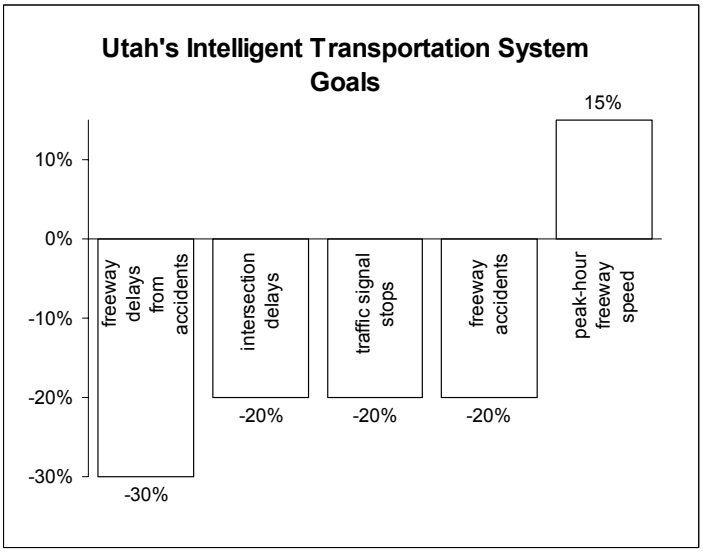
Goal 3: *Efficiency & Economy*. Provide information for operators and users of the transportation system to help reduce congestion and increase the effective capacity of the system thus reducing the need for construction of new roadway capacity.

Goal 4: *Mobility & Access.* Develop an electronic information network that works in concert with the physical infrastructure to maximize the efficiency, safety, and utility of the system and provide more efficient intermodal connections and consumer choice.

Goal 5: *Energy & Environment.* Use facilities, technology, and information to help reduce energy consumption and negative environmental impact such as that caused by vehicle emissions.

5 Much of this information was adapted from: *Delivering the Future of Transportation—The National Intelligent Transportation Systems Program Plan: A Ten-Year Vision.* January 2002. The Intelligent Transportation Society of America, pp 4-6.

In addition to these more general ITS goals, UDOT aims to achieve the following, more specific items through ITS deployment in Utah (items based on success of similar ITS deployments in other areas):



- 30% reduction in delays caused by accidents on the freeway
- 20% reduction in average intersection delay
- 20% reduction in traffic signal stops
- 20% reduction in freeway accidents
- 15% increase in peak-hour freeway speeds

To accomplish the ITS goals set for the Mountainland area the following guidelines or objectives for ITS development activities were established.

Objective 1: Develop a system that is compatible with national ITS architecture.
The national ITS architecture is a set of guidelines identifying important commonalities among ITS elements. These guidelines promote the integration of these elements for multiple purposes. The architecture has led to an understanding of standards that are needed for national compatibility.

Objective 2: Develop a system that is integrated with the existing UDOT CommuterLink system.
In order to maintain a system that is integrated and has interoperability between various agencies, the ITS system deployed in the Mountainland region needs to be developed in concert with the existing *CommuterLink* system.

Objective 3: Develop a system that is in harmony with local ITS plans.
As the *CommuterLink* system is expanded into Utah County, developers need to be sure that the plans are in harmony with local government ITS plans, including Mountainland's ITS plans (such as *Mountainland's ITS Deployment Plan* and *ITS Communication Study*).

PROJECT TYPES

The following are an example of ITS projects that are being planned for Mountainland's planning area. A more complete list of the projects planned can be found in the *Mountainland ITS Deployment Plan* located on the Mountainland website.

1. *Closed Circuit Television Camera Surveillance:* provides real-time picture of highway conditions and incidents on routes throughout the highway system.

2. *Advanced Rail Crossing Warning:* alerts drivers of a blocked rail crossing well in advance so that the driver may take an alternate route.

3. *Traffic Monitoring Stations*: provides vital, real-time information about traffic volumes and speeds.

4. *Road Weather Information System*: provides real-time information on weather and pavement conditions that can then be relayed to the traveling public.

5. *Variable Message Signs:* provide the traveling public with information about road conditions ahead so that the driver can take appropriate action.

6. *Highway Advisory Radio:* provides traveling public advice about road and weather conditions via a car radio frequency.

7. *511 Traveler Information Hotline*: Voice activated phone system that delivers real-time information on construction and maintenance projects, road closures, major delays, special events, weather and road conditions, and transit operations.

8. *Transportation Information Website*: provides real-time information on construction and maintenance projects, road closures, major delays, special events, weather and road conditions, and transit operations.

9. *Hazardous Materials Management:* a computerized model that provides information about the movement of hazardous materials through the area.

10. *On-board Passenger Counting System:* provides vital information about passenger boarding and alighting by location and time of day.

11. *Electronic Reader Boards*: Located at train stations and at key bus stops, they give arrival times and traveler information for incoming buses and trains.

12. *Traffic Signal Interconnect Projects*: Link traffic signals to allow better signal coordination along main corridors and better access to update signal timing plans.

NON-MOTORIZED TRANSPORTATION

As Utah Valley grows and develops there is an increasing need and demand for shared use paths, neighborhood pathways, introduction of painted bike lanes, sidewalks, and pedestrian friendly zones. There is a desire in the community to better identify and preserve this pedestrian and bicycle access through trail, path, and mixed land use development. By encouraging the development of a valley-wide non-motorized transportation system and through changes in land use patterns vehicle trips can be reduced and traffic congestion mitigated. This will create a substantial community resource by providing transportation alternatives, recreational opportunities, environmental aesthetics, development mitigation, open space preservation, and increased property values.

This document combines trail systems adopted in each of the cities of Utah Valley. Guidelines for neighborhood pathways linking residents to schools, services, and employment are included. Pedestrian and bicycle access is addressed through suggested corridor locations linking urban centers to a grade separated trail system. Further land use, pedestrian friendly zones, and traffic calming methods are included to improve non-motorized access within the urban centers and along the corridors. A Citizen Advisory Committee has been instrumental in determining the non-motorized network, construction standards, land use guidelines, and street treatments.

Existing trails plans, trail information, traffic calming, pedestrian improvements, and land use plans or specifications have been integrated to result in a comprehensive valley-wide non-motorized transportation system. The integration of the many existing separate trail plans should lead to a regional pedestrian and bicycle system. Pathway improvements and pedestrian friendly zones will connect cities, residential areas, commercial areas, social services, employment, and other modes of transit to the regional trail system.

College Connector Trail, Provo

In November 2001, as part of the Governor's Trail Initiative, Utah State University (USU) conducted a statewide survey on public use and attitudes towards trails. USU broke the results down by state planning districts; the Mountainland AOG is one of seven regions. Results of that survey indicate widespread use, support, and demand for both motorized and non-motorized trails throughout the state and within the Mountainland region. The following summarizes those results.

PUBLIC ATTITUDES AND DEMAND FOR TRAILS

1. Summary of Mountainland Planning District Results:[6] The use of trails by residents in the Mountainland Planning District is significant; as well over half of the respondents are Trail Users (51.4%), somewhat higher than the statewide results and the second highest among the seven Planning Districts. The use of trails appears to be a significant part of Mountainland Trail Users recreational activity and lifestyle:

a. Trail Users used trails, on average, 18 times in the past 12 months. Use of trails is a family

6 A Statewide Telephone Survey Of Utah Residents' Attitudes Toward Recreational Trails, Institute for Outdoor Recreation and Tourism, College of Natural Resources, Utah State University, Professional Report IORT-PR2001-6, November 2001.

affair, 80% of Trail Users indicating there were other household members who have used

trails in Utah County in the past 12 months, higher than the statewide result. Slightly over 22% of Non-Users of Trails indicated there were other household members who have used trails in Utah County in the past 12 months, well over the statewide result.

b. Hiking was the most mentioned trail activity at 69% of Trail Users. Biking/Mountain Biking is the second at 30%, well over the statewide result of 23% and at the highest percentage of all seven Planning Districts. Walking at 15%, All Terrain Vehicle (ATV) Driving at 13%, and Horseback Riding at 8%. Birdwatching/Wildlife Viewing at 5%, Backpacking at 5%. All other trail activities were mentioned by less than 4% of Trail Users in the Mountainland Planning District.

c. Trail Users in the Mountainland Planning District, who indicated they were aware of a trail within 15 minutes of their home or workplace, also gave a wide range of responses regarding the use of this trail, ranging from never to 432 times a year, with average use of this trail at 52 times a year, well over the statewide of 42 times a year, and a median use of 12 times a year.

d. Trail Users indicated their favorite trail was 37 minutes from home, ten minutes less than the statewide response of 47 minutes. 45% indicated their favorite trail was within 15 minutes of home, 75% indicated their favorite trail was within 30 minutes of home, well over the statewide result of 65%.

e. 82% of Trail Users and 58% of Non-Users of Trails indicated they would like to use trails more than they did in the past 12 months.

f. 45% of Trail Users in the Mountainland Planning District indicated they would support the use of additional public funds for motorized trails; 82%, indicated their support for the use of additional public funds for non-motorized trails.

g. Support from Non-Users of Trails is similar, with 47% supporting the use of additional public funds for motorized trails and 73% supporting the use of additional public funds for non-motorized trails.

h. 93% of Trail Users and 66% of Non-Users of Trails strongly agree or agree that having quality trails in Utah was personally important to them.

i. A majority of both Trail Users and Non-Users of Trails agree that trails in their area result in economic benefit for local communities.

j. 91% of Trail Users and 81% of Non-Users of Trails agree that preservation of historic trails in Utah is important.

k. 92% of Trail Users and 66% of Non-Users of Trails strongly agree or agree that trails in their area allow them to be physically active and lead a healthy lifestyle.

l. Having trails in or near a community in the Mountainland Planning District is perceived as doing much for the quality of life of both Trail Users and Non-Users of Trails.

2. Conclusion: About half of Utah residents used trails in the state during the last year, but a majority of both Trail Users and Non-Users of Trails would like to use trails more than they currently do. Large majorities of respondents feel trails provide important personal and historic benefits and add to their quality of life. A majority also feels trails provide local economic benefits. Utahans are also willing to use additional public funds for trails.

ELEMENTS OF A TRAIL NETWORK

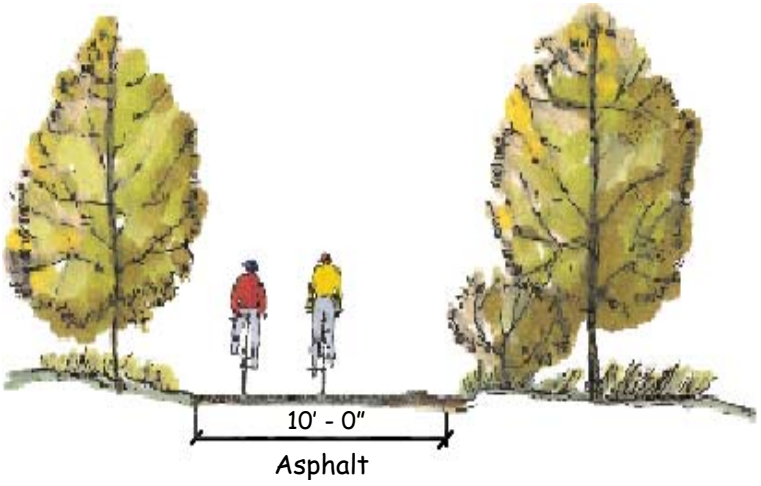
An efficient trail network should coordinate both existing and future trail connections. Pedestrians and bicyclists will use a continuous trail system that travels to important destinations and from one city to another. A network of trails can be created by using linear corridors such as rivers, creeks, lakefronts, and utility easements.

New residential and commercial development should develop non-motorized access; trail connections, and public easements as shown on the master plan maps. It's suggested that each developer meet with planning staff to interpret the valley-wide trails master plan, and the plan's relationship to the proposed development. This includes the consideration and possible connection of any trail concepts within the proposed development to the valley-wide trail system. Public access can be guaranteed in new developments through the dedication of public trail easements, building standards, and zoning.

Locations for signs need to be evaluated on a case-by-case basis and limited to avoid visual pollution. Regulatory signs, such a stop sign and speed limit signs, should be placed according to requirements set forth in the manual on Uniform Traffic Devices for Bicycle Facilities and apply to all paved trails. Informational signs, such as yield hierarchy and trail user courtesy signs should generally be placed at all major trailhead facilities and city parks where the trail can be accessed. Signs should be located where they are visible and where they do not present a hazard to trail users or impede trail use.

BIKE/PEDESTRIAN FACILITIES - TYPES AND CLASSIFICATIONS

1. Shared Use Path: Generally, shared use paths should be used to serve corridors not served by streets and highways or where wide utility or former railroad right-of-way exists, permitting such facilities to be constructed away from the influence of parallel streets. Shared use paths should offer opportunities not provided by the road system. They can provide a recreational opportunity or, in some instances, can serve as direct commute routes if cross flow by motor vehicles and pedestrians is minimized. The most common applications are along rivers, canals, utility rights-of-way, former or active railroad rights-of-way, and within college campuses or within and between parks. There may also be situations where such facilities can be provided as part of planned developments.



Another common application of shared use paths is to close gaps in bicycle travel caused by construction of cul-de-sacs, railroads, and freeways or to circumvent natural barriers (rivers, mountains, etc). While shared use paths should be designed with the bicyclist's safety in mind, other users, such as pedestrians, joggers, dog walkers, people pushing baby carriages, persons in wheelchairs, skate boarders, and in-line skaters are also likely to use such paths.

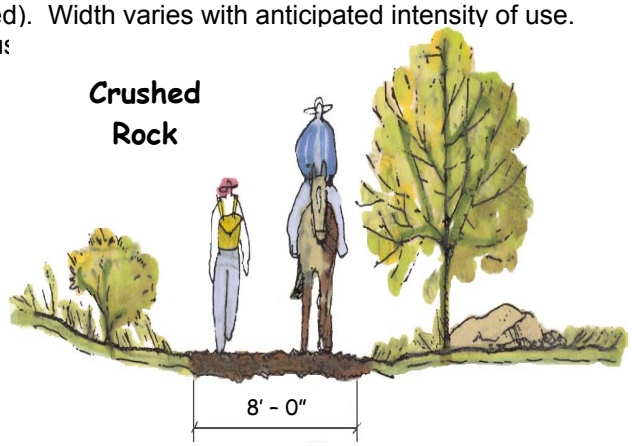
In selecting the proper facility, an overriding concern is to assure that the proposed facility will not encourage or require bicyclists or motorists to operate in a manner that is inconsistent with the rules of the road. The needs of both motorists and bicyclists must be considered in selecting the appropriate type of facility.

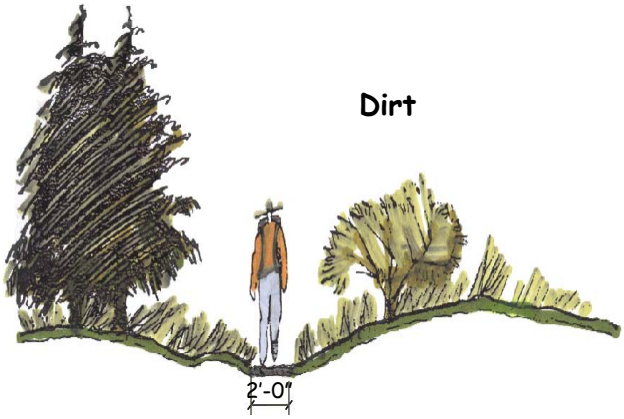
An important consideration in selecting the type of facility is continuity. Alternating segments of shared use paths and bike lanes along a route are generally inappropriate and inconvenient because street crossings by bicyclists may be required when the route changes character. Also, wrong-way bicycle travel

with the higher potential for crashes may occur on the street beyond the ends of shared use paths because of the inconvenience of having to cross the street to access bike lanes.
Sidewalks generally are not acceptable for bicycling. However, in a few limited situations, such as on long and narrow bridges and where bicyclists are incidental or infrequent users, the sidewalk can serve as an alternate facility, provided any significant difference in height from the roadway is provided, or users are protected by a suitable barrier between the sidewalk and roadway. Any federally funded project is required to conform to the existing American Association of State Highway and Transportation Officials (AASHTO) Design Guidelines. Refer to current AASHTO Guidelines.

2. Crushed Gravel Trail: Anticipated uses along crushed gravel trails include mountain bikes, pedestrians and horses (where specifically designated). Width varies with anticipated intensity of use. Generally, 10 feet is the minimum width for all multi-us trail widths may be appropriate, where specialized purposes are anticipated, such as pedestrian only, or one-way trails. However, few trails in urban areas will be of such limited patronage, and should be very carefully considered.

Surface drainage across soft-surfaced trails should be designed to minimize erosion of the trail surface and edges.





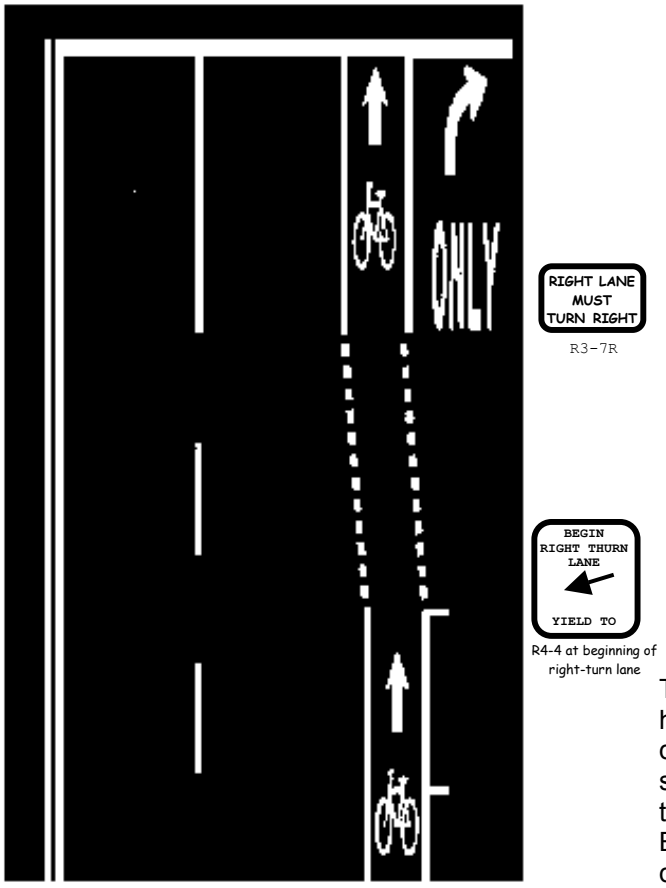
3. Back Country: Back Country trail types are generally used when a low volume recreational use is anticipated and to access natural areas.

4. Bike Lane or Bicycle Lane: Bicycle facility type is dependent on many factors, including the ability of the users, specific corridor conditions, and facility cost. The descriptions below provide an overview of each facility type and general design. Bike lanes are established with appropriate pavement markings and signing along streets in corridors where there is significant bicycle demand and where there are distinct needs that can be served by them. The purpose should be to improve conditions for cyclists on the streets, creating a "bicycle friendly" environment. Bike lanes are intended to delineate the right-of-way assigned to bicyclists and motorists and to provide for more predictable movements by each.

Bike lanes also help to increase the total capacities of highways carrying bicycle and motor vehicle traffic. Another important reason for constructing bike lanes is to better accommodate bicyclists where insufficient space exists for comfortable bicycling on existing streets. Reducing the width of vehicular lanes or prohibiting parking in order to delineate bike lanes may accomplish this. In addition to lane striping, other measures should be taken to ensure that bicycle lanes are effective facilities. In particular, bicycle-safe drainage inlet grates should be used, pavement surfaces should be smooth, and traffic signals should be

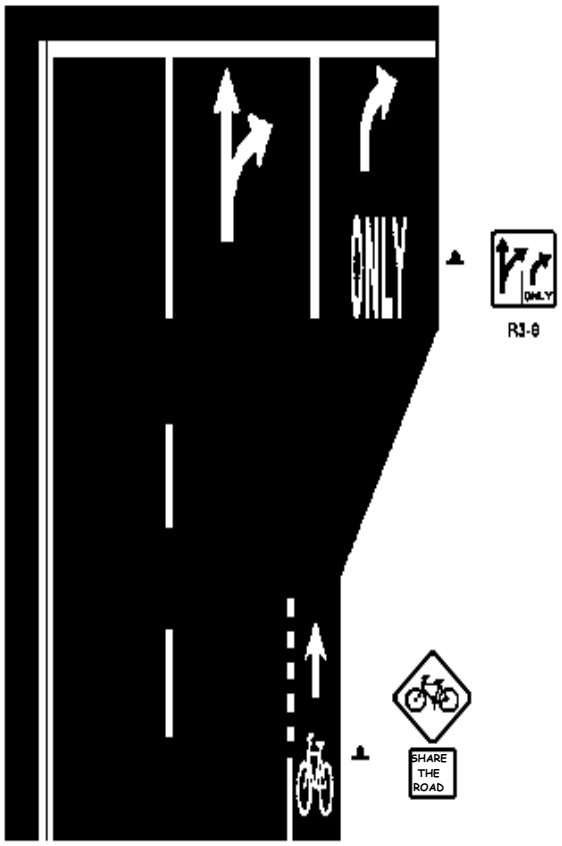
responsive to bicyclists. Regular maintenance of bicycle lanes should be a top priority, since lanes with potholes, debris, or broken glass, present unnecessary hazards to users.

If bicycle travel is to be improved, special efforts should be made to assure that a high quality network is provided with these lanes. However, the needs of both the motorist and the bicyclist must be considered in the decision to provide bike lanes.



R4-4 at beginning of right-turn lane

Parking lane into right-turn-only



Optional right/straight and right-turn-

To varying extents, bicycles will be used on all highways where they are permitted. Bicycle-safe design practices, as described in this guide, should be followed during initial roadway design to avoid costly subsequent improvements. Because most existing highways have not been designed with bicycle travel in mind, roadways can often be improved to more safely accommodate bicycle traffic.

Design features that can make roadways more compatible to bicycle travel include bicycle-safe drainage grates and bridge expansion joints, improved railroad crossings, smooth pavements, adequate sight distances, and signal timing and detector systems that respond to bicycles. In addition, more costly shoulder improvements and wide curb lanes can be considered.

Width and on-street parking are the most critical variables affecting the ability of a roadway to accommodate bicycle traffic. In order for bicycles and motor vehicles to share the use of a roadway without compromising the level of service and safety for either, the facility should provide sufficient paved width to accommodate both modes. This width can be achieved by providing wide outside lanes or paved shoulders.

On street parking can create numerous conflicts for bicyclists. Cars parking or leaving must cross the bike lane, and doors opening into the path of the bicyclist can cause real difficulties. Where parking is allowed, clear pavement markings and signage are needed to alert drivers to share the roadway safely. Wider bike

lanes, 5-7 feet wide, also assist bicyclists by providing adequate maneuvering room to avoid sudden door openings.

5. Bicycle Compatibility Index: Bike lanes are an important element in the overall transportation plan, providing a sense of place for bicyclists, and alerting motorists to the need to share the roadway. Without good quality facilities that users are comfortable on, the goals for increasing non-motorized mode splits will never be realized. Bicyclists (and pedestrians) must feel invited, safe, and comfortable within the transportation network, or few will make the effort to get out of their cars.

The need to accommodate the bicycling public is gaining greater recognition, and good tools for planning and designing bicycle compatible routes are becoming more common. Recent research in bike/automobile interaction has been combined with bicyclist survey data to create the **Bicycle Compatibility Index (BCI)**[7], a useful analysis tool that can help bicycle coordinators, transportation planners, traffic engineers, and others to evaluate the capability of specific roadways to properly accommodate both motorists and bicyclists. The BCI was developed and is being promoted under the direction of the Federal Highway Administration.

Improved safety for both motorists and bicyclists is a major goal for the Utah Valley Non-Motorized Transportation Plan, and inclusion of bicycle lanes wherever appropriate, and exclusion wherever inappropriate, must be carefully planned. The BCI, along with local information and knowledge, are used to consider the needs of both bicyclists and motorists to develop or improve roadways for shared use by these two modes of transportation. For a list of roadways with added bike lanes see Section Three Transportation Systems Needs - Non-Motorized Trails and Bike Lanes.

6. Shared Roadways: To varying extents, bicycles will be used on all highways where they are permitted. Bicycle-safe design practices, as described, should be followed during initial roadway design to avoid costly subsequent improvements. Because most existing highways have not been designed with bicycle travel in mind, roadways can often be improved to more safely accommodate bicycle traffic. Design features that can make roadways more compatible to bicycle travel include bicycle-safe drainage grates and bridge expansion joints, improved railroad crossings, smooth pavements, adequate sight distances, and signal timing and detector systems that respond to bicycles. In addition, more costly shoulder improvements and wide curb lanes should be considered.

Bike Lane on 1200 South, Orem

Width is the most critical variable affecting the ability of a roadway to accommodate bicycle traffic. In order for bicycles and motor vehicles to share the use of a roadway without compromising the level of service and safety for either, the facility should provide sufficient paved width to accommodate both modes. This width can be achieved by providing wide outside lanes or paved shoulders.

7. Signed Shared Roadway: Signed shared roadways are designated by bike route signs, and serve either to:

a. Provide continuity to other bicycle facilities (usually Bike Lanes)

b. Designate preferred routes through high-demand corridors.

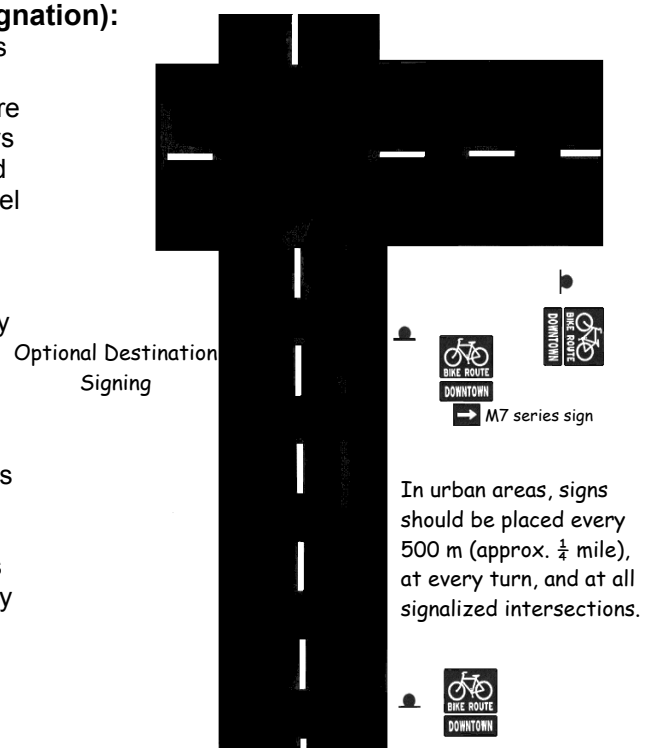
As with bike lanes, signing shared roadways indicates to bicyclists that using these routes provides particular advantages compared with alternative routes. This means that responsible agencies have taken

7 D.L. Harkey, D.W. Reinfurt, M. Knuiman, and A. Sorton, *Development of the Bicycle Compatibility Index: A Level of Service Concept, Final Report*, Report No. FHWA-RD-98-072, Federal Highway Administration, Washington, DC, August 1998.

actions to assure that these routes are suitable as shared routes and will be maintained in a manner consistent with the needs of bicyclists. Signing also serves to advise vehicle drivers that bicycles are present.

8. Shared Roadway (No Bikeway Designation): Most bicycle travel in the United States now occurs on streets and highways without bikeway designations. This probably will be true in the future as well. In other cases, some streets and highways may be unsuitable for bicycle travel at present, and it would be inappropriate to encourage bicycle travel by designating the routes as bikeways. Finally, some routes may not be considered high bicycle demand corridors, and it would be inappropriate to designate them as bikeways regardless of roadway conditions (e.g., minor residential streets).

Touring bicyclists use some rural highways for intercity and recreational travel. In most cases, such routes should only be designated as bikeways where there is a need for enhanced continuity with other bicycle routes. However, the development and maintenance of l.2-m (4-foot) paved shoulders with a 100-mm (4-inch) edge stripe can significantly improve the safety and convenience of bicyclists and motorists along such routes.



CREATING A PEDESTRIAN ORIENTED LANDSCAPE

The basic features of walkable streets are safe street crossings, a continuous network of wide sidewalks, and “calmed” auto traffic. Additionally, it is important to furnish the walking environment with improvements to enhance the convenience and pleasure of walking. These improvements are often called “amenities” or "street furniture,” and include such things as seating, bus shelters, and drinking fountains. Other improvements include lighting for night walking, signs to orient pedestrians, and awnings for protection from rain or sun. Landscaping and street trees also make walking more desirable.

The design and location of pedestrian amenities is important. Many benches, bus shelters, and other improvements are not well utilized because of ineffective design or poor placement on the street. Placement of trash receptacles, seating, lighting, and other amenities should be tailored to specific locations rather than be placed in a regimented pattern (i.e., every 50 or 100 feet along a street).

Walking adjacent to solid objects weighing a thousand pounds and up and traveling at speeds an order of magnitude faster than you, can be intimidating and unpleasant. A buffer is often needed between pedestrians and vehicular traffic. One common buffer is a planter strip with grass, shrubs, and/or trees. Another buffer method is to allow on-street parking in commercial areas. The motionless cars provide a six-foot barrier between the sidewalk and the moving traffic.

1. The Sidewalk and walkway network: Cities can improve the facilities used by walkers and bicyclists further increasing the attractiveness of non-motorized travel. Walkways are most convenient when they have numerous connections, creating direct routes in many directions. Grid pattern streets with short blocks provide lots of direct connections. In contrast, long blocks provide fewer connections. Dead-end, cul-de-sac, and circular streets force not only cars, but also pedestrians into circuitous journeys to reach relatively close destinations. Creating walkways can provide non-polluting, direct and comfortable connections between these types of neighborhoods.

2. Parking lots and driveways: Auto-oriented development places parking convenience ahead

of pedestrian convenience. Parking lots are commonly placed between the street and the buildings, so that cars can pull off the road and park immediately. Instead, when buildings surround the street, a defined space is created in which the auto presence is less predominant. Less obvious parking lots that are shared by property owners, and placed between or behind storefronts, are much more appealing for pedestrians. Parallel parking is another option for pedestrian oriented commercial developments. Cars that are parallel parked along streets benefit pedestrians by providing the buffer between walkways and the moving traffic. In existing parking lots safety (and use of space), can also be improved by:

- Defining parking space with curbs and landscaped islands that elevate walking routes to the building
- Good nighttime lighting
- A network of walkways

3. Intersections and Crosswalks: The most dangerous place for pedestrians is crossing the street-and crossing paths with the flow of cars. Most intersections are designed to facilitate rapid traffic flow, forcing those on foot to cross wide expanses of roadway, dodge fast-turning vehicles and wait for long periods of time for the right to cross.

Contrary to common belief, simply marking a crosswalk is not the answer to making intersections safer and more pedestrian friendly. Marked crosswalks can give pedestrians a false sense of security and aren't an effective way to slow traffic. Alternatives to marking a crosswalk are design features, which enhance pedestrian safety and ease the crossing at intersections. Effective intersection design features include: curb bulbs, narrower turning radii, eliminated free right turn lanes, pedestrian conscious walk signals, mid-block crossing, and raised medians.

4. Safety and Speed: Walking in the midst of auto traffic is unpleasant at best and dangerous at worst. As the design of our streets has grown increasingly auto oriented, the needs of pedestrians have often been overlooked. Wide, visually interrupted roadways send the message that they are for cars, not people. These roads encourage increased speeds and lull drivers into paying less attention to non-motorized road users. Transportation planners and engineers, elected officials and policy makers, businesses and citizens can each play a role in focusing attention on pedestrians' needs and advocating pedestrian-friendly street design.

The most important factor for pedestrians on the street is the speed of vehicles. High-speed traffic, which is intimidating for pedestrians, increases road noise and shortens reaction times for drivers. Drivers are less likely to yield for pedestrians and, when collisions occur, serious pedestrian injuries are more likely to result.

Simply lowering the posted speed limit may seem like the most logical strategy for slowing traffic in specific areas. However, the design of streets conveys a message about appropriate auto speed independent of posted speed limits. Drivers travel faster on roads that are wide, that lack sharp turns, and that allows the driver to see a longer distance ahead. In the U.S., posted speed limits on streets are typically set so that they are exceeded by 15% of vehicles using the road. In spite of lower posted speed limits, drivers will tend to travel at the speed that is comfortable under the road design.

5. Traffic Calming Techniques: Streets that do not provide a safe path for pedestrians or bicyclists are hazardous. In many instances, automobiles travel too fast for the safety and comfort of the pedestrian and bicyclist-even if they do have their own path. Traffic calming designs, special considerations for bicycles, and sidewalks are all techniques to apply to the street network to increase the safety of the pedestrian and bicyclist.

Traffic calming techniques, such as traffic circles, curb bulbs, trees, raised medians and changes in the road surface, can all be used to slow traffic, thus raising the safety and comfort levels of pedestrians and bicyclists. People generally measure their travel to a desired destination in terms of time rather than

distance. By slowing the traffic speeds there should be a general shortening of trip lengths. This means less travel and therefore fewer vehicular emissions.

The following traffic calming design techniques are alternatives to simply lowering the posted speed limit. These design techniques involve varying the width of the road and adding vertical features that can be used to redesign streets to convey a message of "This is a shared space" rather than "This road is for cars."

a. **Traffic Circles:** Traffic circles are raised medians placed at the center of an intersection to slow high-speed traffic on neighborhood streets. Additionally planting the raised island with flowers, shrubs, or trees beautifies the neighborhood.

b. **Curb Bulbs:** Also called "curb extensions" or "chokers," curb bulbs are designed to make pedestrian crossing easier by narrowing the roadway at crosswalks by way of an extended sidewalk and giving more visibility to the waiting pedestrian. Also, a shorter crossing distance reduces the time pedestrians are exposed in the roadway.

c. **Diagonal Diverters:** Diagonal diverters are barriers that extend diagonally across residential intersections. They are effective in reducing "cut-through" traffic where drivers slice through neighborhoods to circumvent congested intersections. Full diverters are placed diagonally across the whole intersection, forcing vehicles to turn in one direction at the intersection. Semi-diverters extend just halfway across the intersection to prevent vehicles from entering a street in one direction.

d. **Neckdowns:** Neck downs are landscaped islands that extend from the curb onto the roadway, often to line up with parallel parking lanes.

e. **Gateways or Entrance Islands:** Gateways can define the transition between an arterial and a local street. This transition sends a strong visual message to a motorist: "Slow down, you are entering a special area!"

f. **Interrupted Sight Lines:** "S" bends incorporated into the roadway, on street parking and neck-downs in a staggered fashion (to create bends in the vehicle flow of traffic), prevent the motorist from seeing a long way into the distance-which tends to force them to reduce speed. Interrupted sight lines can be an effective and visually pleasing traffic calming technique when planned correctly.

g. **Trees:** When planted close to the street, trees visually narrow the apparent street width as they mature. Trees also soften a landscape that is dominated by pavement and help beautify an area.

h. **Changes in Road Surfaces:** Surface changes, including changes in paving materials or color, can make the roadway appear narrower than it really is and can augment the visual message telling drivers to slow down. Textured crosswalks, for example, project the sense that pedestrians belong at the intersections.

i. **Speed Tables:** Slightly raised section of the roadway, like "speed bumps," but significantly longer are called speed tables. However, whereas vehicles can actually cross a speed bump more comfortable at a higher speed, this is not true with the design of the speed table.

j. **Raised Medians:** Raised medians are elevated strips, often landscaped, that run mid-road and parallel to traffic. They also narrow the roadway space devoted to vehicles, as well as providing pedestrians a refuge when crossing arterials.

Certain treatments may be used to enhance both the pedestrian environment and access to public transit. Bulb-outs are often used to create protected bus loading zones out of the traveled way. It is also important to consider any negative effects that traffic calming treatments may have on transit routing and operations, as good transit service is a key part of the walkable community.

Walking and biking can and must be made comfortable, safe, and desirable; otherwise people will for the most part choose other modes. Incorporating well designed and constructed trails, bike lanes, sidewalks, street furniture, traffic calming, and other appropriate elements into the built environment invites people to walk and bike. Doing so is critical to the goal of reducing dependence on the automobile for

transportation. The non-motorized Trail / Pedestrian / Bike Lanes projects can be found in the Transportation System Needs, Section Three.

RECREATIONAL MOTORIZED TRAILS

Within the last decade, our area has seen dramatic increases in sales and use of Off Highway (OHV) and All-Terrain Vehicles (ATV), and a resultant increase in demand for motorized access to public lands. Similar to the non-motorized needs, motorized trails and facilities are needed to provide mode choices and increased recreational opportunities for area residents and visitors. This demand requires careful planning and coordination in order to provide good access and trails on public lands, protect resources and sensitive areas, and mitigate or eliminate any negative effects of past practices.

The purpose of this section is to illustrate and respond to public demand by inventorying existing OHV/ATV facilities and trails, and provide a basis for coordinating with federal, state, and local jurisdictions in planning proper motorized trails systems within the Utah County MPO.

FEDERAL RECREATIONAL TRAILS PROGRAM

The Federal Recreational Trails Program (RTP) was authorized in the Transportation Equity Act for the 21st Century in 1998. The RTP is a Federal-aid assistance program to help the States provide and maintain recreational trails for both motorized and non-motorized recreational trails use. The motorized program provides funds for trails for snowmobiles, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, or using other off road motorized vehicles. The large tracts of federally managed property make a huge difference in the quality and number of these facilities in available or buildable in our area.

The Uinta National Forest, the larger of the two forests within Utah County boundaries, has for decades accommodated a large percentage of motorized trail access within the region. They recognize and address some of these issues in its Forest Management Plan Revision. Speaking of both motorized and non-motorized uses:

> "Comprehensive trail planning is needed, recognizing that demand will not always be met. At present there are various conflicts between users… The largest problem seems to be the lack of consistent travel management direction…Trail systems need to be planned to accommodate allowed types of uses and provide good loop opportunities... Many trails have evolved without considering suitability and priority of uses. Difficulty levels for the types of use are not identified by signing or maps. The presence of mixed uses needs to be understood. In some limited situations, the provision of quality versus quantity should be examined before the appropriate mix of uses is determined." [8]

Because the Uinta National Forest is considered an urban forest, and shares boundaries with local jurisdictions along the Wasatch Front, and that there is a high demand for access along the front, across jurisdictional boundaries, the Service also understands the need to coordinate its efforts with local agencies. These joint boundaries, and desire for access across them, create interdependence between the many agencies: need for improved coordination and access to professional, experienced trail planners, designers, and builders is called for.

The State of Utah has funded and helped develop trails systems statewide. In February 2002, Governor Michael Leavitt established the Olympic Trails Legacy Initiative, also known as the Governor's Trail Initiative (GTI). The purpose of the GTI is to assist in planning and development of high-quality, comprehensive trail systems. GTI documents recognize the lack of and need for comprehensive trail planning in both motorized and non-motorized modes. Public demand is high and growing.

> "With all their attributes of usage, trails and pathways are high priorities for our citizens. Trails are perceived as an important component of quality growth, community fitness, economic benefit, and recreation. Trails provide access to Utah's outstanding public lands, wildlife enjoyment, and healthy social interaction in our communities. Nearly half of our citizens use trails regularly. Trail use is a significant part of recreational activity, tourism, and lifestyle in Utah."[9]

8 Uinta National Forest Management Plan Revision, *Analysis of the Management Situation*, August 1999
9 *Executive Summary, Establishing An Olympic Legacy for Trails in Utah 2002-2004*, Utah Division of Parks and Recreation

However, problems are also growing due to demand and lack of structured resources:

> "Lack of riding areas, untrained riders, trespass, and environmental damage is a growing but solvable problem. OHV user education is crucial; however regional and community planning processes should seek to accommodate motorized recreations areas using significant property taxes paid by OHV users." [10]

Many local communities have had unrestricted motorized access to the adjacent foothills along the Wasatch Front, creating environmental damage, ugly visible scars, and problems of trespass on private property. The increasing usage of OHV/ATV's continues to put pressure on access and trails systems both statewide and locally. Better design, coordination, and management are critical needs to reduce or eliminate the negative impacts while accommodating a public need.

Nearby public lands, mainly those of the Uinta National Forest and some BLM lands have and will continue to accommodate motorized access as per their trail plans. Where those access points will be provided, how and by whom, good design and management, and funding are issues now facing all jurisdictions within the MPO and county.

PUBLIC ATTITUDES AND DEMAND

During November 2001, the GTI partnered with Utah State University to survey public attitudes towards trails. Favorable attitudes toward trails and trail use within the Mountainland AOG service are overwhelmingly positive, according the survey data.[11] While the majority of 93% of Trail Users and 66% of Non-Users of Trails strongly agree or agree that having quality trails in Utah was personally important to them. Respondents favor non-motorized trails and activities, a significant number list OHV/ATV trail use as the mode of choice. Results of the survey are summarized below:

- Trail Use Preferences
  Hiking - 69%
  Walking -15%
  Biking/Mountain Biking - 30%
  All Terrain Vehicle (ATV) Driving - 13%
  Horseback Riding - 8%
- Use of Public Funds for Motorized Trails
  45% of Trail Users would support the use of additional public funds for motorized trails, somewhat less than the statewide result of 48%
  Support from Non-Users of Trails is similar at 47%
- Attitudes Towards Trails in General
  Having trails in or near communities in the Mountainland Planning District of Utah, Summit, and Wasatch Counties is perceived as doing much for the quality of life of both Trail Users and Non-Users of Trails.

INCLUSION OF MOTORIZED TRAILS IN THE LONG RANGE PLAN

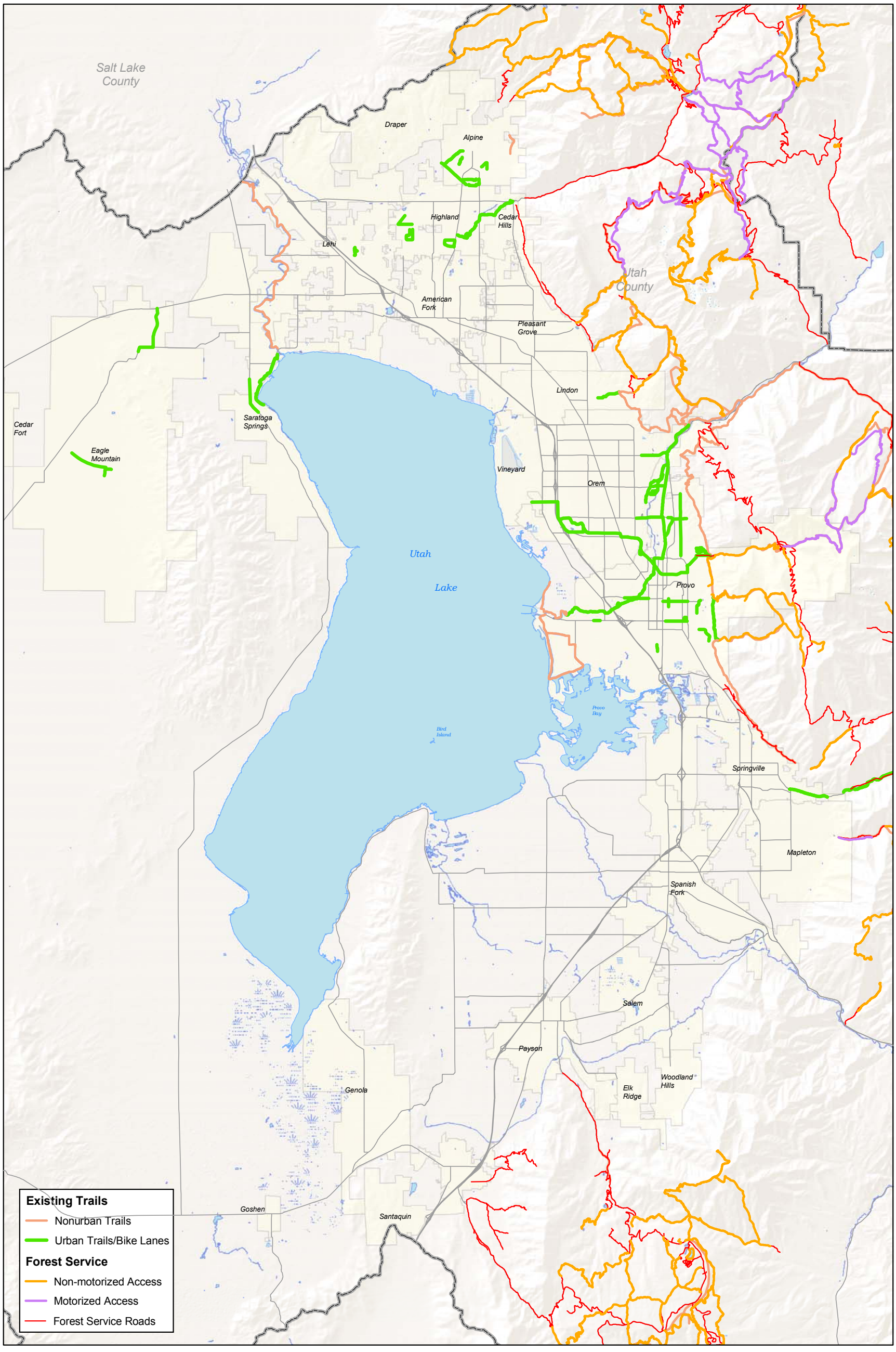
Inclusion in the Utah Valley Long Range Plan will be an effort to help facilitate and properly plan for the quickly increasing demand for such facilities. Without good planning and proper regulation in the past, conflicts between user travel modes, conflicts with private property owners and public land managers, and improper use on public lands have been widespread.

Reducing these conflicts and ill effects through proper recognition of the demand, development of facilities, and coordination with land managing agencies to help improve conditions for both motorized and non-motorized trail users are the major goals of the program. The Utah Valley Motorized Trails Program will work to address these issues through proper planning and coordination with the efforts of other agencies and jurisdictions within the Mountainland service area.

10 ibid.

11 *A Statewide Telephone Survey Of Utah Residents' Attitudes Toward Recreational Trails,* Institute for Outdoor Recreation and Tourism, College of Natural Resources, Utah State University, Professional Report IORT-PR2001-6, November 2001

EXISTING TRAIL FACILITIES
NON-MOTORIZED AND MOTORIZED



PARK AND RIDE

Park and ride facilities are an important component in improving the air quality and traffic congestion problems that currently exist in Utah Valley. These problems will increase as population and employment grow. Park and ride facilities help decrease the number of single occupant vehicles on the transportation system by ensuring that people will have a transition point from their single occupant vehicles to ridesharing and mass transit. The resulting ridesharing and use of mass transit reduces fuel consumption, mobile source emissions, traffic congestion, and destination parking requirements.

PARK AND RIDE DEMAND

According to UTA's Quarterly Survey there were on average 613 cars parked at Utah Valley park and ride facilities each weekday in 2002. Using 2030 population growth projections for Utah County cities, an estimate of potential, future park and ride users resulted in the Projected 2030 Park and Ride Demand table. The table shows a significant increase in the potential demand for park and ride facilities in Utah Valley by 2030.

The potential park and ride demand can be converted from people to park and ride stalls by dividing the potential demand by an average person per vehicle factor. This factor was derived from a park and ride study conducted in 2000 at sixty-two park and ride lots in the four urban counties along the Wasatch Front.

From this information, an average weekday factor of 1.84 persons per vehicle was derived (see Mountainland's *Utah Valley Area Park and Ride Lot Plan, available by request*). This factor takes into account bus and car/van pool trips, as well as the average weekly park and ride usage.

It is estimated that half of the potential commuter parking demand is accommodated by resources other than exclusive-use park and ride lots, such as kiss-and-ride, feeder bus routes or auxiliary lots (joint-use lots, on street parking, vacant lots, etc.). By reducing the potential park and ride pool by 50% and by dividing by the park and ride factor (units are in daily persons per vehicle), the total number of park and ride stalls needed to meet the daily demand can be calculated. This analysis shows that in 1990, 1,180 park and ride stalls would be needed to accommodate commuter parking. This number rises to 3,338 stalls in the year 2030.

PARK AND RIDE DEMAND TABLE

Year	Potential P&R User Pool	Other Resource Reduction (50%)	Average P&R Usage Factor	Total # of P&R Stalls Needed
2000	4,344	2,172	1.84	**1,180**
2030	12,282	6,141		**3,338**

EXISTING PARK AND RIDE FACILITIES

Existing park and ride lots fall into two categories: *exclusive-use* and *joint-use*. Exclusive-use lots are built for the specific purpose of providing a park and ride functions. These lots are usually owned by UDOT and primarily serve traffic on interstates and other major arterials. Joint-use lots share under-utilized public or private parking lot space that is being used for other purposes such as shopping or Sunday worship. The main advantage of joint-use lots is the cost, which is usually little, if any. Despite a lack of a formal agreement between private owners and UTA, many businesses have not objected to the use of their parking lots by commuters. However, some locations have so many commuters using the lots that the businesses' customers have trouble finding parking and conflicts arise.

The total number of improved and unimproved exclusive-use stalls currently in Utah Valley is 535, of which 447 are improved and 88 unimproved. There are also many other locations in the Utah Valley area being used for commuter parking, such as businesses, churches, vacant lots, and public streets that are

not designated official park and ride locations. The Existing Exclusive-Use and Joint-Use Park and Ride Lot Locations table offers specific information about the existing park and ride facilities in Utah Valley from north to south. See the Transit Service and Park and Ride Lot Map, page 46 for locations of existing Park and Ride Lots.

EXISTING EXCLUSIVE-USE AND JOINT-USE PARK AND RIDE LOT LOCATIONS

	Use	Location	Capacity	Ave. Usage	Owner	UTA Service
1	Exclusive	I-15 and SR-92-Lehi	45	40-50	UDOT	No
2	Exclusive	Redwood (SR-68) and Main (SR-73)-Lehi	33	5-12	UDOT	No
3	Exclusive	I-15 and Main St. American Fork	120	95-125	UDOT	No
4	Exclusive	I-15 and 1600 North, Orem	78	16	UDOT	Yes
5	Exclusive	I-15 and 800 North (SR-52), Orem	57	41-55	Orem City	Yes
6	Exclusive	I-15 and Center St., Orem	58	20-35	Orem City	Yes
7	Exclusive	I-15 and 400 South (SR-77), Springville	65	25-35	UDOT	No
8	Exclusive	I-15 and 800 South, Payson	36	6-12	UDOT	Yes
9	Exclusive	I-15 and Main Street, Payson	58	5-10	UDOT	No
A	Joint	US 89/State Street and 1200 North, Lehi	-	20-30	LDS Church	Yes
B	Joint	240 West State Street, American Fork	-	80-100	Smith's & K-Mart	Yes
C	Joint	100 East Main, American Fork	-	20-40	Albertson's / LDS Church	Yes
D	Joint	800 North (SR-52) and University Ave (US 189), Orem	-	25-50	Utah Power & Light	Yes
E	Joint	1200 South 400 West, Orem	-	25-30	LDS Church	Yes
F	Joint	1100 South 700 East, Orem	-	36-80	UTA	Yes
G	Joint	1300 South University Ave, Provo	-	8-12	Sam's Club	Yes
H	Joint	1000 North Main, Spanish Fork	-	30-40	C-A-L Ranch Stores; Shopko	No

Most of the existing, exclusive-use facilities that are improved and signed are operating at over 80% capacity. It should be noted that there is some unused capacity at the unimproved and unsigned locations. The number of people using park and ride lots appears to increase substantially when the lot is improved and identified with a sign informing people that commuter parking is acceptable at the location. Park and Ride Projects can be found in Transportation System Needs, Section Three.

SAFETY

In response to new FHWA guidelines, the urbanized area will use safety to help determine highway and local road improvement priorities along with capacity and volume concerns. The goal is to reduce overall accidents or at least limit the severity of potential accidents.

As highway design has improved over the years, accident rates and the severity of the accidents have been drastically reduced. Modifications such as improved barriers protection, better sight distance through improved geometric design, the mitigation of dangerous railroad crossings, and intersection improvements including better pedestrian protection, are being used when new roads are built or when older roads are improved.

The objective is to include safety concerns into the criteria the Congestion Management Committee evaluates when selecting priority projects for study and subsequent funding. Projects that come before the committee for consideration will be prioritized based on the identification of accident "hot spots" then recommended to the Technical Advisory Committee for action toward funding to make the needed improvements to improve those locations.

The Utah Department of Transportation has a department goal of reducing overall road accidents by 10% for the next 5 years, and reducing school age pedestrian and work zone accident rates by 20% during the same 5 years. The MPO has also adopted these goals and will work in concert with UDOT to meet them.

CRASH DATA

All police agencies throughout the state report transportation crash data to UDOT for compilation, analysis, and archiving. The UDOT Safety Office is providing raw crash data for the MPO service area to Mountainland for analysis purposes.

Mountainland has identified "hot spots," including roadways and intersections deemed to have high crash severity or incidents. The raw crash data has been geo-coded and crash incidents mapped. Baseline data will be established using region-wide crash data and GIS modeling to indicate roadways, intersections, and travel zones most in need of attention.

Analysis will include consideration of crash numbers, types, and severity. Further consideration will be made in consultation with traffic engineers to determine deficiencies in design, operation, and maintenance. Conclusions and recommendations will be communicated to the responsible agency, and the MPO will work with them to resolve those issues.

The Motor Vehicle Crashes and Motor Vehicle and Bike/Pedestrian Crashes – Utah County, 1996-2001 tables and maps summarize motor vehicle (MV) crashes and motor vehicle crashes with bicyclists or pedestrians (MV/Bike/Ped), reported by law enforcement within Utah County for the years 1996-2001.

Raw data was collected and provided by the Utah Department of Transportation from police crash reports. There were 40,889 reported crashes over the five-year study period (1996-2001). 88% of the total and 72% of MV/Bike/Ped reports provided clearly identifiable locations, and these will be used as the basis of the crash data analysis. The remaining 12% will be identified only in summary totals.

This initial "quick" analysis has helped identify the 12 regional roadways of most concern, and these will be the focus of further more intensive study of crash data and causes.

Due to publication time constraints, further refinement of the data and more intensive analysis of location, roadway configuration, injuries/fatalities, and other factors contributing to crashes, was not carried out. It is anticipated that this will occur with the next Long Range Plan update.

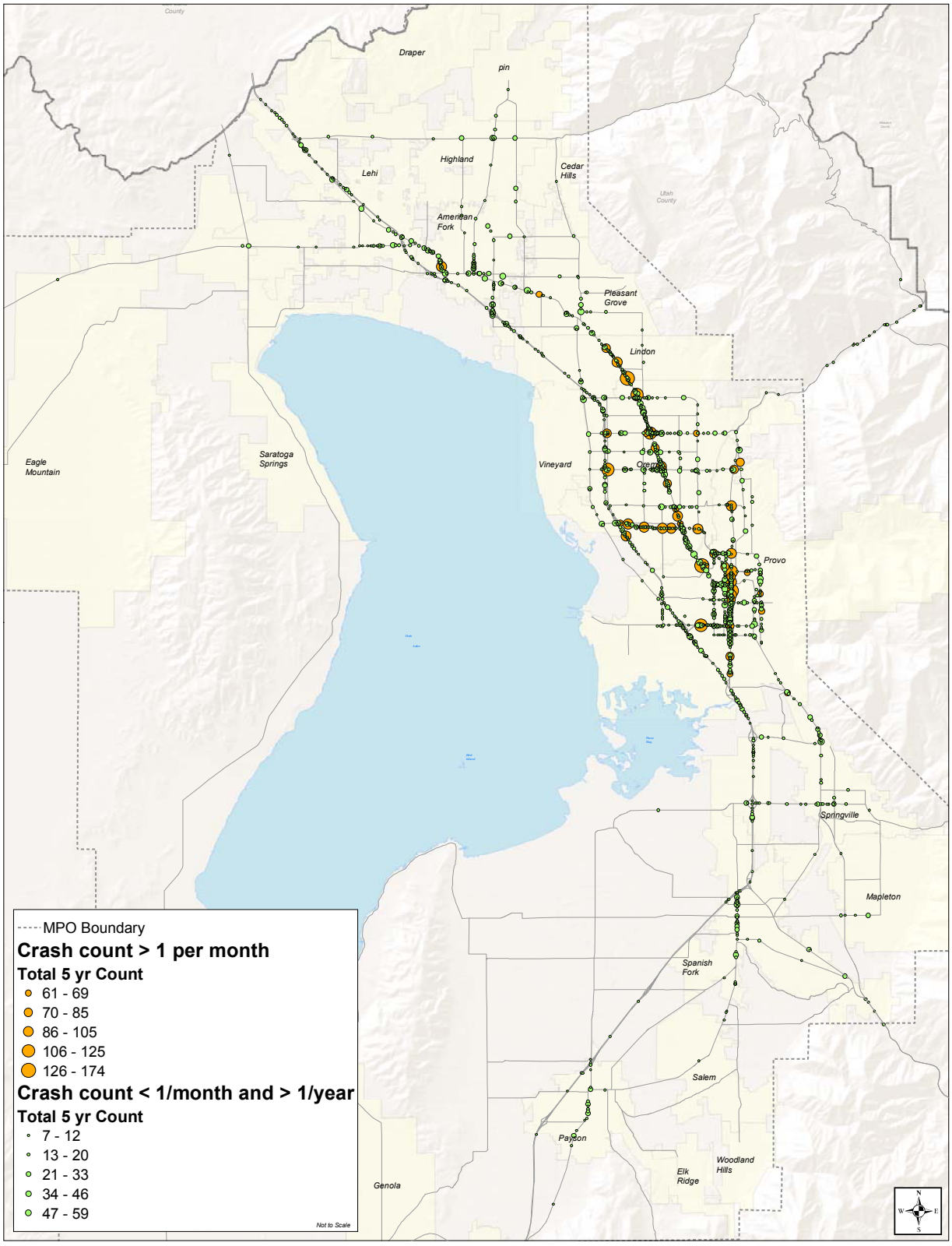
MOTOR VEHICLE CRASHES - UTAH COUNTY 1996-2001

Roadway Name	5 Year Summary MV Crashes	Percent of Total	Average # per year
US 89 Mapleton to Lehi	7,436	18.19%	1,487.2
I-15	5,546	13.56%	1,109.2
University Avenue	3,422	8.37%	684.4
University Parkway	1,506	3.68%	301.2
800 North Orem	1,072	2.62%	214.4
Geneva Road	805	1.97%	161.0
Lehi Main Street	553	1.35%	110.6
US-6	539	1.32%	107.8
Spanish Fork Main Street	531	1.30%	106.2
US-189/Provo Canyon	419	1.02%	83.8
Provo Center Street (1-15 to 500 West)	404	0.99%	80.8
Sum of Remaining Corridors	13,952	34.12%	2,677.6
Unidentified Locations	4,704	11.50%	
Total	40,889	100.00%	7,237.0

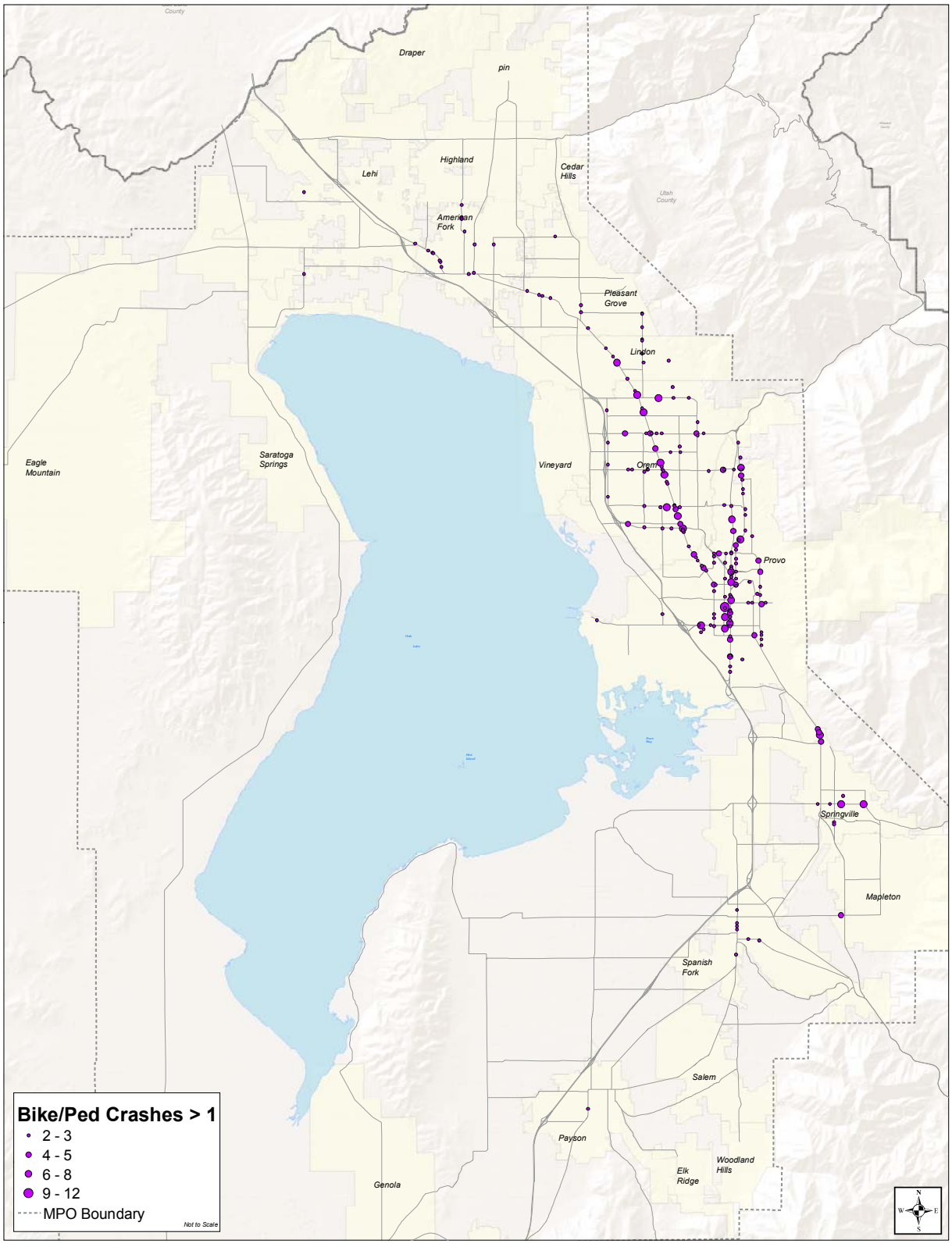
MOTOR VEHICLE AND BIKE/PEDESTRIAN CRASHES - UTAH COUNTY 1996-2001

Roadway Name	5 Year summary MV/ Bike/Ped Crashes	Percent of Total	Average # per year
US 89 Mapleton to Lehi	281	16.45%	56.2
University Avenue	116	6.79%	23.2
US-189/Provo Canyon	57	3.34%	11.4
800 North Orem	42	2.46%	8.4
University Parkway	31	1.81%	6.2
Spanish Fork Main Street	18	1.05%	3.6
Provo Center Street (1-15 to 500 West)	17	1.00%	3.4
Geneva Road	10	0.59%	2.0
Lehi Main Street	9	0.53%	1.8
I-15	8	0.47%	1.6
US-6	1	0.06%	0.2
Sum of Remaining Roads	645	37.76%	128.0
Unidentified Locations	473	27.69%	
Total	1,708	100.00%	247.0

MOTOR VEHICLE CRASHES MAP
1996-2001



BIKE AND PEDESTRIAN CRASHES MAP
1996-2001



New Projects and Improvements: Once the crash data has been analyzed for the identified hot spots, Mountainland staff will encourage potential project sponsors to incorporate safety strategies such as those listed on page 39 from the AASHTO Strategic Highway Safety Plan. Mountainland will also encourage sponsors to apply for funding to implement these strategies in all new projects and to make improvements to maintenance and operations of existing roadways.

STATE TRAFFIC AND PEDESTRIAN SAFETY COORDINATING COUNCIL

The Utah Legislature established the State Traffic and Pedestrian Safety Coordinating Council in 1999 and gave it the mission to investigate and promote improvements to the safety of the roadway and pedestrian network statewide. Mountainland staff sits on the council and is working with it to establish goals and priorities for improvements. The Safe Routes to School program and identification of safety hazards across the state are two priorities of the Council. As recommendations are made and adopted, Mountainland will seek to incorporate those into the Long Range Plan as appropriate.

PEDESTRIAN AND BICYCLE CRASH ANALYSIS TOOL

A key element in the effort to reduce accident rates is the real reduction in pedestrian/auto and bicycle/auto accidents. Baseline data will be established using region-wide crash data and GIS modeling to indicate roadways, intersections, and travel zones most in need of attention. Data analysis tools such as the Pedestrian and Bicycle Crash Analysis Tool (PBCAT), a database for analyzing crash and injury information and recommending appropriate countermeasures, will be used to guide the MPO and local authorities in intersection and roadway design. The PBCAT will also help set the priority for which projects are targeted for improvement.

SAFE ROUTES TO SCHOOL

Safe Routes to School programs (SR2S) are community initiatives involving parents, school officials, engineers, police, and local leaders in identifying and overcoming obstacles to safe walking and bicycling from home to school for kids.

In *Utah Code, 53A-3-402, School Boards:* local school boards are required to plan for safety improvements for child access, for all school children through grade 9.

> *Subsection 16* "Each board shall establish for each school year a school traffic safety committee to implement this Subsection 16.
> (ii) review and submit annually to the Department of Transportation and affected municipalities and counties a child access routing plan for each elementary, middle, and junior high school within the district."

Mountainland staff will to seek to work with school districts and communities in establishing safe walking and bicycling routes from home to school for K-9 age students. The PBCAT and other appropriate tools can be used in the Safe Routes to School analysis. Mountainland will offer to the school districts mapping and analysis support in identifying appropriate routes, inventorying problems along chosen routes, and coordination with UDOT and local governments in efforts to resolve safety issues.

Use of workable projects from other established SR2S programs will be evaluated and forwarded for adoption or modification as warranted.

AASHTO STRATEGIC HIGHWAY SAFETY PLAN[12]

Nationwide 1 out of every 84 children born today will die violently in a motor vehicle crash, while six out of every ten children will be injured in a motor vehicle crash over the course of their lives, many of them more than once. 3,100 injury crashes and 40 fatal crashes occur on roadways in Utah County each year.[13] At 13.2 injuries per million vehicle miles traveled, Utah County shares with Salt Lake County the highest rates in Utah.

The American Association of State Highway and Transportation Officials (AASHTO) developed the Strategic Highway Safety Plan to address those statistics. The mission of the plan is to reduce the nationwide number of deaths by 5,000 to 7,000 each year, as well as to reduce health care costs substantially.

1. **Non-Motorized - Making Walking and Street Crossing Safer:** On average, a pedestrian was killed about every hour and a half on the nation's roadways during 1995 nearly 5,600 men, women, and children. Though this represents an encouraging 18 percent decrease over the last decade, new strategies that address the various issues associated with pedestrian collisions are needed to further reduce pedestrian deaths and injuries.

   STRATEGY - Develop programs to improve pedestrian and bicycle safety accommodations for intersections and interchanges. In spite of the fact that pedestrians are supposed to cross at intersections as opposed to midblock, many of our intersections are not pedestrian or bicycle friendly. This initiative will evaluate crash data, assess existing guidelines, and seek to develop improvements to highway design and traffic control to better accommodate pedestrians and bicyclists. Pedestrians and bicyclists as well as transportation professionals at the State and local levels will be involved in the process.

2. **Highways:** Reducing Vehicle-Train Crashes, Keeping Vehicles on the Roadway, Minimizing the Consequences of Leaving the Road, Improving the Design and Operation of Highway, Intersections, and Reducing Head-on and Across-median Crashes.

- **Reducing Vehicle-Train Crashes:** Each year, hundreds of fatalities are sustained at the nation's ubiquitous highway-rail grade crossings. Many are the result of drivers deliberately circumventing or otherwise purposely violating active control devices. In other cases drivers are unsure of their responsibilities because warning devices, both active and passive, are perceived by motorists as ambiguous. There also exists a general lack of public awareness about highway-rail crossings that may be traced in part to ineffectual licensing and driver education efforts.

  STRATEGY - Deploy passive warning devices from the MUTCD. A number of crashes occur at crossings that have only signing. It is not feasible to upgrade all passive devices to active ones, but the effectiveness of passive devices can be improved.

- **Keeping Vehicles on the Roadway:** When a vehicle leaves the roadway, the result is often disastrous. A full one-third of all traffic fatalities involve this scenario. The statistics are even worse in rural areas, where two-thirds of fatalities are due to vehicles first leaving the road and then overturning or hitting fixed objects such as trees. In order to reduce the injuries and fatalities due to vehicles leaving the road, efforts must be made to: (1) keep vehicles from leaving the road, (2) reduce the likelihood of errant vehicles overturning or crashing into objects near the roadway, and (3) minimize the severity of an overturn or crash.

  STRATEGY - Implement a comprehensive program to improve driver guidance through better pavement markings and delineation. Nighttime crash rates are three times greater than daytime rates. Limited visibility contributes to this differential and can be partially addressed through improved pavement makings and delineation. The visibility needs of the growing population of older drivers is to be emphasized.

12 American Association of State Highway and Transportation Officials, *AASHTO Publication*, SHSP 1998.
13 Utah Department of Transportation Crash Summary 1996-2001.

STRATEGY - Implement a targeted shoulder rumble strip program. Retrofit the rural interstate and other fatigue-prone facilities with shoulder rumble strips. Fatigue is a major factor in drift-off-the-road crashes on the rural interstate and other freeways because of the longer duration of trips and the monotony of the driving task. In addition to the rural interstate, rumble strips on urban interstate and on rural two-lane highways with full shoulders should be considered.

- **Minimizing the Consequences of Leaving the Road:** One-third of all fatalities result from vehicles leaving the road and hitting some fixed object or overturning. Leaving the roadway in rural areas is especially threatening to life and limb, as two-thirds of fatalities registered in rural settings result from this event. In addition to keeping vehicles on the roadway, it is important that we reduce the opportunity for vehicles to overturn or strike fixed objects when they stray and minimize injuries when they crash with a fixed object.

  STRATEGY - Provide improved practices for the selection, installation, and maintenance of upgraded roadside safety hardware. The design of roadside safety hardware (guard rails, bridge rails, proper curb types, concrete barriers, drainage grates, etc.) can substantially affect the severity of crashes and loss of life.

  STRATEGY - Implement in an environmentally acceptable manner to address hazardous trees removal. Nationwide there are more deaths associated with crashes into trees than any other fixed object, yet very little has been accomplished on a national level to address this problem.

  STRATEGY - Implement a policy to reduce the hazard from roadside utility poles, particularly on two-lane rural roads. Nationwide utility pole fatalities are the second leading fixed object hazard in terms of highway deaths. This initiative will reduce the potential for pole crashes and assist utility companies, state and local transportation professionals in targeting the most hazardous poles for removal/relocation

  STRATEGY - Develop and implement guidance to improve ditches and backslopes to minimize rollover potential. Crashes involving non-traversable ditches and backslopes account for a significant number of highway deaths due to rollovers or sudden impacts.

  STRATEGY - Develop and implement guidelines for safe urban streetscape design. While most fixed object crashes occur in rural settings, urban streets with their high density of flow also have a roadside problem, though not as severe. This initiative will determine the situation where streetscape designs (areas immediately adjacent to travel lanes) adversely affects safety.

- **Improving the Design and Operation of Highway Intersections:** Injury and fatality statistics for highway intersections and interchanges are ample evidence that strategies to improve the safety of these crash-prone areas are urgently needed. About one in every four fatal crashes occurs at or near an intersection, one-third of which are signalized. Safety literature also indicates that the two most prominent crash scenarios involve left turns and being struck from the rear. Right-angle collisions are a predominate cause of death at signalized intersections.

  STRATEGY - Improve the safety of intersections using automated methods to monitor and enforce intersection traffic control. A recent safety campaign against red-light running called attention to the problem and initiated some countermeasures to impact it. This initiative is designed to advance the status of previous work by developing both conventional and second generation ITS solutions to the problem Improve intersection safety through upgrading of signalized intersection controls that smooth traffic flow

  STRATEGY - Improve intersection safety through upgrading of signalized intersection controls that smooth traffic flow. Supplementing the previous initiative, many right angle and rear end crashes occur because of poor signal timing between adjacent intersections. This initiative

seeks to smooth traffic flow by synthesizing information on the problem, defining effective countermeasures, and developing guidelines for the application of proven traffic control technologies.

- **Reducing Head-on and Across-median Crashes:** One of the most severe types of crashes occurs when a vehicle shifts into an opposing flow lane and crashes head on with an oncoming vehicle. Severe crashes of this sort occur primarily on rural two-lane highways and freeways with narrow medians. The severity of these crashes is compounded because of the additive nature of the vehicle speeds at the time of collision.

  STRATEGY - Develop and test innovative centerline treatments to reduce head-on crashes on two-lane highways. Head-on crashes in which one vehicle crosses the centerline are a major cause of death on two-lane highways. This effort seeks to identify promising countermeasures that can reduce the level of head-on crashes, field test the most promising alternatives, including center rumble strips and define effective treatments that are cost effective

  STRATEGY - Reduce across-median crashes on freeways and arteries that have narrow medians. Combinations of heavy traffic flow and high operating speeds, narrow medians, and inadequate left shoulders can increase the probability of a head-on collision caused by median cross over. In many cases, the solution is placement of a median barrier between opposing flows. This initiative will identify those freeways and arterials with historically high numbers of across-median crashes and will encourage the State and local governments to incorporate median barriers or other positive protection elements between the flows.

TRANSIT

The Long Range Transit Plan identifies strategic options for the role of public transit in Utah County. This plan identifies mass transit needs as well as intercity travel between Utah County and Salt Lake Valley with a thirty year planning horizon. The Long Range Transit Plan relies on the recommendations derived from the recently completed Inter-Regional Corridor Alternatives Analysis (IRCAA). This study provided potential solutions to meet future travel demands through 2030 and it produced a Locally Preferred Alternative (LPA), which included highway and transit projects or improvements and was adopted by the Utah Valley Regional Planning Committee in October 2001.

BACKGROUND

The transit district is funded through a one-quarter of one-cent sales tax used for both operation and capital expenses. Additional revenue is received through fares paid and federal grants received annually for capital expenses. Approximately 94% of Utah County residents live in communities served by UTA (2000 Census population). Areas served by transit district:

- Alpine
- Highland
- Mapleton
- Pleasant Grove
- Spanish Fork
- American Fork
- Lehi
- Orem
- Provo
- Springville
- Cedar Hills
- Lindon
- Payson
- Salem
- Sundance

CURRENT TRANSIT SERVICE

The eleven local bus routes focus on connecting residential areas with major activity centers, such as Brigham Young University, Utah Valley State College, University Mall, downtown Provo, Provo East Bay, Provo Towne Centre Mall, and to businesses along the State Street/US-89 corridor. Generally, these local routes operate once every half hour except in select corridors where service is more frequent. All local routes are time sequenced to transfer to or from the main core route, which has fifteen-minute frequency and operates between the major activity centers.

There are five express or commuter bus routes, which focus on transporting individuals between Utah County and Salt Lake Valley. Ten northbound trips in the morning and ten southbound trips in the evening service the commuter market. In addition, one Salt Lake/Utah County route services the commuter market by connecting to Salt Lake's light rail line, TRAX, and operates during the day and every 10-20 minutes during the peak commuter periods.

In addition to local and commuter bus service, UTA also provides winter ski service, paratransit for disabled residents, and service for special events. Facilities used for transit in Utah County include UDOT owned park and ride lots and one transit center at the University Mall, Orem. UTA, UDOT, and Mountainland are working together to improve transit service to existing park and ride facilities. UTA recently entered into an agreement to use selected and approved LDS Church parking lots as transit park and ride lots.

PARATRANSIT SERVICE

Paratransit is a service offered to persons with disabilities in Utah Valley area and is in compliance with the Complementary Paratransit Service provision of the Americans with Disabilities Act (ADA). The service is provided by the United Way of Utah County through the direction of UTA who is responsible for mobility compliance with the ADA Act for the Wasatch Front.

Paratransit offers transportation to persons that are prevented from using the fixed UTA routes available to the general public. Persons that are mentally, physically, or temporarily disabled may be eligible for the

service. Eligible riders may ride to and from any location within the Utah Valley UTA service area. An application for determining who may be eligible can be obtained from the United Way Transportation Services of Utah County. Once a person has applied and been approved to ride the Paratransit Vans, they can schedule trips by calling United Way.

The United Way paratransit fleet consists of 15 wheelchair lift equipped vans. Currently the system handles most passenger demands for trips. When requesting the van, the rider tells the operator all their desired destinations and when they want to be picked up from each locale. If the rider's preferred schedule cannot be accommodated they will be scheduled for the next available trip.

The UTA Board of Trustees recently passed a fare increase that affected the cost of paratransit service; a one-way trip fare is now $1.25. That price will increase annually until 2004 at which time the fare will be double the amount of the regular bus fare. A one-way trip consists of pick-up at one location and a drop-off at another location. A person can go to more than one location using the van, but each new location is considered a trip and will be charged the one-way fare. A driver can wait up to ten minutes at a location while a rider completes their task. All pick-up times have a 30-minute window of when the van will actually arrive. This means the rider must be ready to leave 20 minutes before the scheduled pick-up time or wait up to 20 minutes after the scheduled pick-up time.

1. Funding Paratransit: In 1991, UTA developed a plan to establish a paratransit system, which meets the requirements of ADA. The Utah County portion of UTA Paratransit has been in compliance with the ADA requirements since it commenced. Each year the budget has grown to keep up with operating expenses and passenger demand, but has not kept up with inflation, cost of living for employees, and replacement and updating of equipment. The number of riders has increased steadily due to knowledge of the service and the fast growing population of the area.

The high population growth rate coupled with the need to finance higher wages for employees has made it difficult to project future funding needs based on past trends. Therefore a base was derived by UTA for the expenses and the number of passenger trips. From these two base numbers a percentage growth rate was generated. Then the other categories were added to this growth rate to extend them to the expenses and passenger trips base rates. These numbers were used in the following Paratransit System Projection charts to estimate the long-range needs.

2. Current Trends: Providing paratransit service to the eligible members of the transit district is financially cumbersome for UTA. In response UTA is exploring ways to make the service less costly. Geographically based computer scheduling software is being developed to make more efficient routing of paratransit vehicles. Since all regular buses became ADA accessible in April 2002, refinements have also been made in the selection of eligible patron. UTA is finding that large paratransit vehicles are never used to capacity and therefore smaller, cheaper vans will be replacing these vehicles as they complete their useful life.

Debates continue on innovative strategies that would further reduce the costs associated with Paratransit. As previously mentioned, UTA recently passed a gradually increasing fare structure for paratransit service. Growth in the county will determine the need for increasing access to this service and greater operating efficiency will make financially feasible.

Since the majority of the urban area is covered by the UTA fixed service, only small areas such as Vineyard, Elk Ridge, Saratoga Springs, Eagle Mountain, Woodland Hills, and unincorporated Utah County might have new service in the 30-year study period. None of these areas are currently large or dense enough to offset the costs and they are near existing UTA fixed service lines.

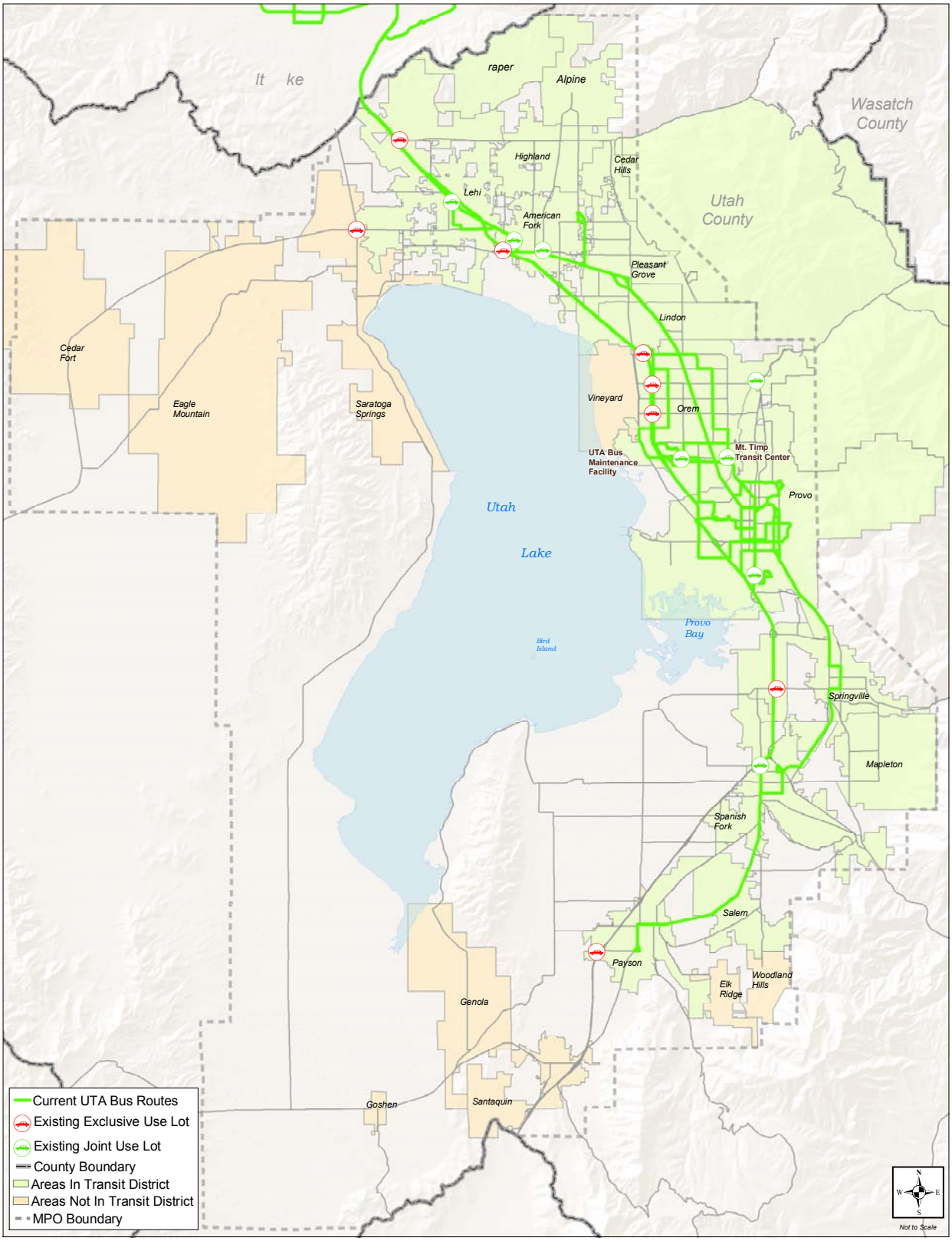
3. The System: There are currently 15 vans on the United Way Paratransit System. If the future scenario were implemented, 6 new vans would need to be brought on line over the 30-year period. This would be equivalent to a new vehicle every 4-years. Ideally, a van has a life span of about 5 years. United Way has a 7-year replacement schedule, which may need to be shortened to 5 years.

Funding for paratransit vans comes from an 80% grant by Federal Transit Administration; 20% of the funding comes from UTA. Funding for vehicles is not shown as part of the United Way paratransit budget since that funding comes out of the UTA general budget.

The cost of a current paratransit van is $60,000. There is a need to replace four vans to bring the fleet up to the 7-year replacement standard. The other vans are spaced out so that the need to replace will be two per year.

UTA has replaced its older buses on Utah Valley's fixed route system with buses that are wheelchair lift equipped. Future transit plans also show increased bus service in the valley with better headways. These actions should lower demand on the paratransit service as some of the current riders will be able to use the new fixed route buses.

EXISTING TRANSIT SERVICE AND PARK AND RIDE LOTS



TRANSPORTATION DEMAND MANAGEMENT

In response to the increasing numbers of single-occupant vehicles and realizing that road funding cannot keep pace with demand national, state, and local policy initiatives have embraced the concept of transportation demand management (TDM). The purpose of TDM is to increase the efficiency of roadway systems by reducing the demand for vehicular travel. TDM strategies are intended to reduce peak-hour travel demands. They include car and van pooling, flexible work hours, telecommuting, alternative transportation use (e.g., bicycle, transit), and parking controls. TDM strategies, by nature of their purpose, also improve environmental concerns associated with vehicular emissions. Reduced demand for vehicular travel directly impacts a reduction in emissions that results in an improvement in regional ambient air quality levels.

CAR AND VAN POOL RIDESHARING

Mountainland has committed CM/AQ funding toward a marketing program run by UTA for the creation of van pools and a car pool matching service. This has met with growing success in forming van pools. The following table includes the operating van pools in 2000.

COMPANY SPONSORED VAN POOLS

Van Number	Company	Van Type	Passengers	Annual Revenue Miles	Start
8506	National Guard	15 passenger van	9	13,845	Utah County
8507	National Guard	15 passenger van	8	9,910	Utah County
8533	UTA	15 passenger van	8	22,837	Utah County
8549s	EG&G	15 passenger van	9	14,095	Utah County
8549i	EG&G	15 passenger van	8	5,865	Utah County
8602	Salt Lake County	15 passenger van	8	18,057	Utah County
8557	EG&G	15 passenger van	8	16,033	Utah County
8621	Qwest	15 passenger van	6	23,796	Utah County
8566	EG&G	15 passenger van	9	11,048	Utah County
8579	Novell	15 passenger van	8	21,232	SL County
8562	Novell	15 passenger van	8	15,604	SL County
8567	Salt Lake County	15 passenger van	7	19,769	Utah County
8580	VA Hospital	15 passenger van	7	20,824	Utah County
8609	4 Life	15 passenger van	6	11,661	Utah County
8609	EG&G	15 passenger van	8	23,796	Utah County
		Total:	117	248,482	

UTA Rideshare also maintains a car pool match list service. This service provides those interested with a list of other travelers from their general origin with similar destinations. This allows people to organize their own car pools and reduce vehicle miles generated from work commutes. About 25% of the Vehicle Miles Traveled is created by work trips, representing only 12% of the total number of trips taken. There are numerous short trips taken each day that are addressed through promotions and advertising (i.e. Skip-a-Trip). Non-motorized modes as well as trip linking will help to reduce these trip miles for air quality purposes and congestion reduction.

TELECOMMUTING

The single largest mode of travel, other than single occupancy automobile, is projected to be telecommuting or working at home. The projected share of telecommuters will increase from 4.36% to 13.52%, representing a 210% increase above natural growth. This projected increase is due to the rise in "information" workers with the accompanying improved technology to transfer information. The Utah County economy is arguably at the forefront of the information and technology industries, which explains why the 1990 census rate of 4.36% is roughly double the telecommuting rate across the country.

A Texas Transportation Institute study found that telecommuting programs resulted in cost savings from reduced office space needs, demand for parking spaces, and employee absenteeism. In addition, offering telecommuting options has helped companies and agencies attract and keep skilled professionals. Telecommuting reduces the number of vehicles on the road during peak-periods. As a result it can help manage traffic congestion, improve air quality levels, and decrease energy consumption. The Texas study supports the experience at the national level that telecommuting does reduce peak period trips and telecommuters' non-work trips do not increase significantly.[14]

It should be emphasized that the mode shares (13.52% work trips) are intended to depict a "typical" commute pattern. A telecommuting rate approaching 15% is not unreasonable, given the national trend. Telecommuting is an effective measure to reduce auto dependency. A higher telecommuting rate can be seen as a typical drive alone commuter working at home one day for every 6 days of commuting. Another way to illustrate this trend is to allow 1 in 6 commuters to work at home. The assumption presented should prove accurate over time, thanks to the coordinated efforts of transportation and air quality planning.

ECO-PASS / ED-PASS

The Eco-Pass program is a program where an entity or business purchases an annual transit passes for every employee, which is good on UTA bus routes and TRAX. The price for the Eco-Pass is based on the level of transit service at each separate business location and the total employee base. A minimum of 35 passes is required and passes must be purchased for all of the employees at a work location.

Utah State Valley College and Brigham Young University have committed to participate in the Ed-Pass program. Ed-Pass program provides a pass to all full time students and faculty and is funded through various student fees. The benefit of continuing the ed-pass with BYU and UVSC is that more than 50,000 people will be much more inclined to choose another option than their car, which will have positive effect on air quality by reducing congestion.

FLEXTIME

Many companies, in an effort to help employees overcome the burden of traveling in peaktime commute, have experimented with work hours other than the standard eight-to-five schedule without compromising customer service or productivity.

Two common options are called the “5-4-9” and “4-10” systems. They operate as follows:

5-4-9 The employee works nine hours per day for eight days and one day for eight hours over a two week period which equals out to 80 hours in nine days. The 10th day of the two week period is an off day and used as a three-day weekend, every other week.

4-10 The employee works 10-hour days four days per week. The fifth day is a day off, making every weekend a three-day weekend.

14 Potential of Telecommuting for Travel Demand Management, Texas Transportation Institute, Fall 1996.

The Federal Fair Labor Standards Act requires that some workers who put in more than 40 hours in a workweek be paid over-time. In order to accommodate the spirit of this act, some adjustment of the official pay period beginning and ending times may need to be made (e.g. start timekeeping for the work week at noon on Monday).

Employees are normally very enthusiastic about alternative work hours because it allows them the flexibility in their week to schedule things such as doctor and dentist appointments, parent-teacher meetings, car repairs, and other errands that are difficult to do in the normal workweek. Studies have shown that use of sick leave and employee turnover rates decline where alternative work hours are allowed.

Alternative work hours also contribute to cleaner air and less congestion by taking a vehicle off the road once every week or every other week.

TRANSPORTATION SYSTEM NEEDS

TRANSPORTATION SYSTEM

Outputs of the transportation system analysis are listed in this section. New projects and programs that are deemed necessary though 2030 are listed. Projects and Programs include: Air, Highway, Congestion Area Improvements, Intelligent Transportation Systems, Non-Motorized Trails / Bike / Pedestrian Facilities, Park and Ride Facilities, and Transit.

AIR TRANSPORTATION

Provo Airport is considered a general aviation airport in the Utah Airport System. The continued economic and demographic growth along the Wasatch Front will exceed the capacities of the Salt Lake City International Airport. Projections prepared by the Federal Aviation Administration indicate that the number of passenger enplanements and aircraft operations is expected to double by the year 2015. However, the recent events surrounding the September 11, 2001, have put a strain on the demand for aviation services on a worldwide scale. A control tower for the Provo Municipal Airport has been identified as needed and is discussed in the Air Transportation in Section Two.

AVIATION DEMAND FORECASTS FOR UTAH VALLEY AIRPORTS

The forecasts are provided in increments of five, ten and twenty years over the 20-year planning period.

UTAH VALLEY AIRPORTS – TERMINAL AREA FORECASTS

					Air Craft Operations					
	Scheduled Enplanements				Itinerant Operations				Local Operations	Total Operations
Name	Year	Air Carrier	Commuter	Total	Air Carrier	Cargo	Other	Total		
Provo Municipal	2000	45,000	14,248	59,248	1,282	900	51,470	53,652	40,268	93,920
	2005	179,900	20,213	200,113	5,110	2,532	67,505	75,147	47,226	122,373
	2010	218,900	24,051	242,951	6,570	3,356	78,224	88,150	50,381	138,531
	2015	266,500	27,211	293,711	7,300	4,155	87,709	99,164	53,053	152,217
	2020	324,300	30,787	355,087	8,030	5,184	96,391	109,605	54,668	164,293
Spanish Fork/ Springville	2000	0	799	799	0	0	7,888	7,888	9,640	17,528
	2005	0	1,143	1,143	0	0	8,393	8,393	10,258	18,651
	2010	0	1,635	1,635	0	0	8,931	8,931	10,916	19,847
	2015	0	2,340	2,340	0	0	9,503	9,503	11,615	21,118
	2020	0	3,347	3,347	0	0	10,112	10,112	12,360	22,472
Cedar Valley	2000	0	0	0	0	0	1,950	1,950	11,050	13,000
Eagle Mountain	2000	0	0	0	0	N/A	0	0	0	0
	2005	0	0	0	0	N/A	5,563	5,563	1,348	6,911
	2010	0	0	0	0	N/A	7,086	7,086	1,713	8,799
	2015	0	0	0	0	N/A	9,029	9,029	2,180	11,209
	2020	0	0	0	0	N/A	11,510	11,510	2,776	14,286

FUNCTIONAL CLASSIFIED ROAD SYSTEM

The major component of the transportation system is the Functional Classified Road System (See Section One for Maps). For highway needs, this is the system that is addressed in this long range plan. Over 85 percent of all travel in the valley occurs on the system. When planning for highway needs, various aspects of travel are considered such as; travel model outputs from traffic modeling, safety issues, local and state input, and financial constraints. The rapid growth since 1990 has created a large increase in travel demand. Utah County has grown by 52%, almost doubles the growth rate of the other urban Wasatch Front counties, and has outpaced all counties for total population growth since 2000. Since 1990, only 1% new capacity has been added to the Functional Classified Road System throughout Utah County. Because transportation facilities have not been financed to keep up with growth, significant congestion is now occurring.

A new capacity highway project is one that has additional travel lanes added to an existing highway or is a completely new highway. Shoulder or turn lane additions to existing highways are not listed as separate projects in the long range plan, they are considered to be funded though safety, preservation, maintenance, and other revenue sources covered in the long range financial plan. The project selection of which new capacity projects to place in the long range plan is a combination of municipalities' recommendations, UDOT and Mountainland staff recommendations, and travel model outputs. All recommendations are modeled for relevancy and projects not needed are discarded. Additional projects are proposed for areas where the model shows capacity additions are needed.

Managing the current highway system includes all activities to keep the highway system running. Operations of the system include the day to day running of UDOT and the municipal road departments and the various programs to monitor the system. Maintenance activities are those associated with the upkeep of the current system. Preservation activities are those that include maintenance above and beyond regular maintenance. Rehabilitation and reconstruction includes those activities that are major reconstructions. Excluded from this category are those projects that include new capacity additions which are included as new capacity projects in this plan. Safety activities include projects that correct hazards. Structure preservation is the rehabilitation of bridges and culverts. Enhancements to the system include landscaping, trails, pedestrian facilities, and other activities.

Areas in the county of most concern are those that are proposed to have the highest growth and congestion. Utah County, population growth over the next 27-years is projected to be 83%; however much of daily trips each person will take is projected to grow by 180%. The large majority of this growth will occur in the north and west county area followed by the south county with the least in the central county. Other than the central county urban core, the majority of these high growth areas have transportation infrastructure that was designed for rural needs. Even though new highway capacity will be needed, capacity improvements to all elements of the transportation system, including transit, bicycle and pedestrian paths, railroad, airport facilities, and the linkages among them, will be required to serve this growth in travel demand.

Several major studies have recently been completed to help address the rapid growth. These studies include: (1) the Utah County I-15 Corridor Management Plan, which looked at the congestion and maintenance needs of I-15 countywide; (2) the North Valley Connectors Study, which looked at the severe congestion problem in the high growth area around Lehi; (3) Inter-Regional Corridor Alternatives Analysis, which looked at the north-south transportation needs along the I-15 corridor throughout the Wasatch Front. A summary explanation of each study follows.

UTAH COUNTY I-15 CORRIDOR MANAGEMENT PLAN

The Utah County I-15 Corridor Management Plan began in May 2001 as collaboration between UDOT, Mountainland, and UTA. The scope of the I-15 Corridor Management Plan was designed to identify transportation needs within Utah County along the I-15 corridor and to develop a management plan for

the expected needs within the planning time frame of 2030. The study was completed in July 2002 and adopted by the Utah Valley Regional Planning Committee in August 2002.

An extensive outreach effort was conducted with agency sponsors and stakeholders to identify perceptions concerning the current and future transportation system and to obtain input on the concepts to consider as part of the analysis. The outreach effort consisted of a partnering session, focus group meetings, general public meetings, and countywide public opinion survey. The combined information from the data analyses and stakeholder input was used to develop study goals, objectives, and evaluation criteria.

Two advisory committees, the Project Management Team and the Working Group provided overall guidance for the I-15 Corridor Management Plan. The Project Management Team was comprised of staff representing the study sponsor agencies (UDOT, MAG, and UTA) and Federal Highway Administration. The Project Management Team provided day-to-day technical guidance for the consultant team.

Meetings were conducted on a regular basis. The Working Group consisted of representatives from local municipalities, Utah County, interested parties, and all members of the Project Management Team. The Working Group provided general guidance to the Project Management Team, gave input on issues, and made recommendations on the corridor alternatives. Meetings with the Working Group were scheduled approximately every two months or as required during the study process.

The I-15 study evaluated the physical condition and operational characteristics of the existing I-15 mainline and interchanges, including:

- An examination of the safety, structural, and pavement conditions of the existing facility and development of recommendations for improving the physical condition of I-15.
- Development and evaluation of alternatives for existing interchanges to increase or improve their existing performance.
- Identification of the demands for existing and additional crossings of I-15 to accommodate community needs.
- Development and evaluation of new interchange locations to meet future demands.
- Development of recommendations for increasing capacity of the mainline.
- Development of a plan for improvements in the corridor through phasing of short, mid, and long-term improvements to I-15.

2030 traffic forecasts were developed for a baseline condition that assumed no major improvements at I-15 interchanges and no new interchanges were constructed. This served as a benchmark for testing new interchange connections for impacts to travel patterns and traffic distributions. While the interchange configuration was consistent with existing and current improvements, the mainline lanes were included to reflect improvements recommended in the Inter-Regional Corridor Alternatives Analysis Study. In addition, the three connections recommended by the North Valley Connectors Study were also included as part of the 2030 Baseline assumptions. The resulting traffic forecasts showed that traffic volumes on many segments of I-15 are projected to double by the year 2030, and the majority of the ramps to and from I-15 will also see a doubling or tripling of traffic demand.

Future traffic operations were then analyzed for the I-15 mainline, for ramp access to and from I-15 and for the ramp intersections at local intersections. These analyses of traffic operations demonstrated the need for major capacity improvements at all but two of the existing intersections locations by the year 2030.

Based on needs identified, corridor wide scenarios were developed that looked at potential new interchange locations along the I-15 corridor. In addition, for each existing interchange conceptual

alternatives were developed that potentially could solve the needs and deficiencies identified by the traffic operations assessment.

The improvements identified to meet the forecasted 2030 demand were then phased to determine priority for construction. These phases are:

- Phase 1 - Improvements needed by 2010
- Phase 2 - Improvements needed between 2011 and 2020
- Phase 3 - Improvements needed between 2021 and 2030

The phasing evaluation looked at the following issues:

- Capacity constraints of existing I-15 mainline with 2001 traffic and projected traffic
- Capacity constraints of existing interchanges with 2001 traffic and projected traffic
- Existing structures with structure service life of less than 10 years
- Safety issues identified in the accident/crash analysis

The recommended improvements by phase are:

PROPOSED IMPROVEMENTS BY PHASE

Phase 1 (by 2010)

- Widen mainline from Salt Lake County line to University Parkway
- Reconstruct 14 interchanges
  - Eight in widened section of I-15
  - Six south of Provo

Phase 2 (2011 to 2020)

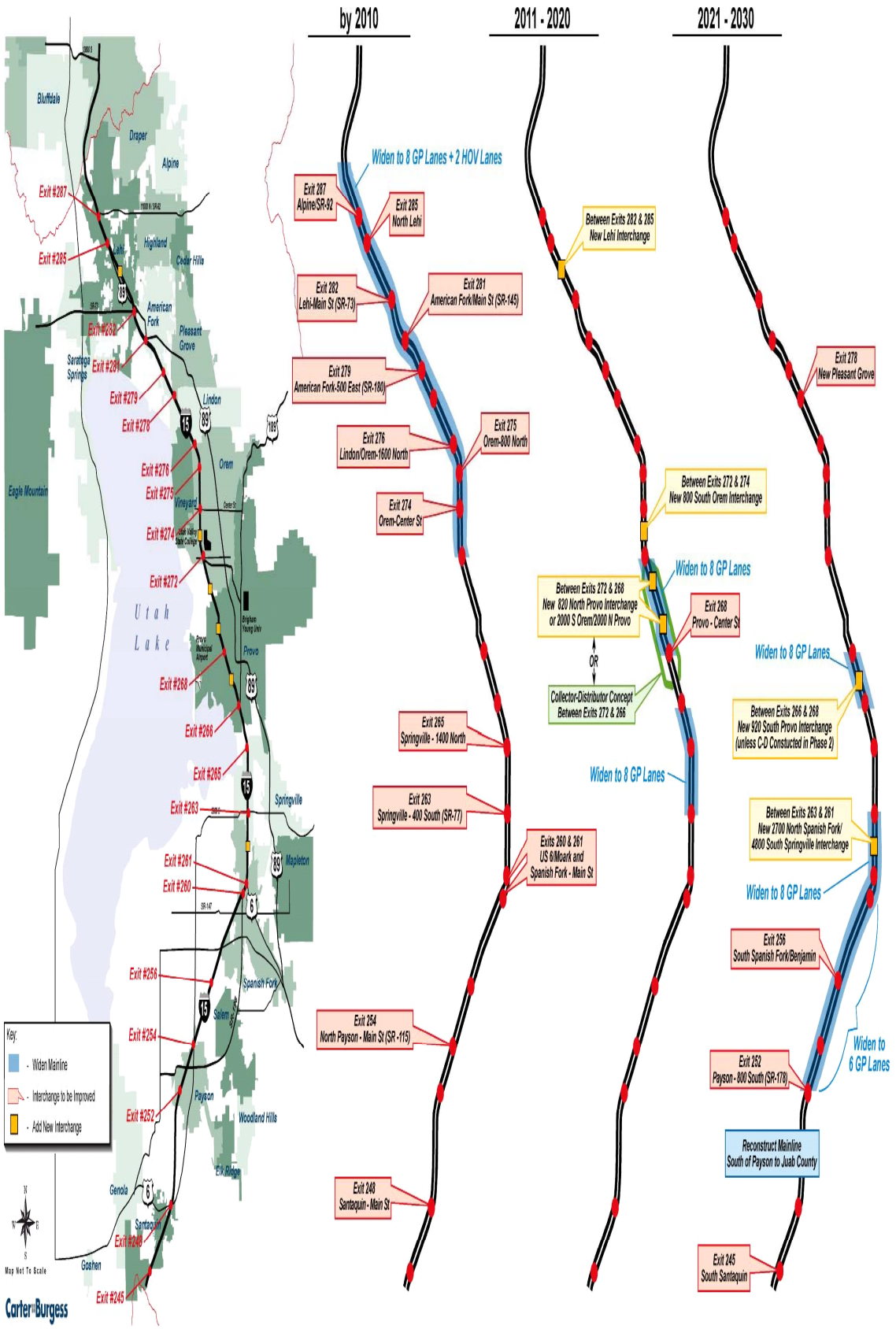
- Extend I-15 mainline widening to Center Street Interchange, Provo
- Widen I-15 mainline between University Ave Interchange, Provo and 400 South Interchange, Springville
- Reconstruct Center Street Interchange, Provo
- Construct the following new interchanges
  - 800 South, Orem
  - Lehi, between Exits 282 and 285
  - Collector-Distributor or new interchange between University Parkway, Orem and Center Street, Provo

Phase 3 (2021 to 2030)

- Widen I-15 mainline:
  - Between Center Street, Provo and University Ave, Provo
  - Between 400 South, Springville and Main Street, Payson
- Reconstruct remaining three interchange
- Construct new Interchanges:
  - Springville / Spanish Fork
  - 920 South, Provo (if Collector-Distributor not constructed during Phase 2)

In addition, investments in intelligent transportation systems (ITS) and infrastructure required for other modes of travel (park and ride lots to support the bus system, a commuter rail system, and a bus rapid transit system) will also be needed.

RECOMMENDED I-15 IMPROVEMENTS BY PHASE



To implement the proposed transportation improvements:

- Determine which elements can be included in the financially constrained Utah Valley Long Range Transportation Plan
- Develop sufficient funding commitments for state and/or local sources
- If required for project implementation, request federal funding and fulfill federal funding requirements
- Satisfy the full requirements of the National Environmental Policy Act through completion of and Environmental Impact Statement (EIS) or Environmental Assessment (EA)
- As projects near implementation, the projects should be included in the Utah Valley Transportation Improvement Program and the State Transportation Improvement Program
- Revisit the I-15 Corridor Management Plan at approximately 5-year intervals to update planning assumptions

NORTH VALLEY CONNECTOR STUDY

The purpose of the North Valley Connector Study (NVCS) was to evaluate the east-west transportation needs in the northwest Utah County area west of I-15 and north of Utah Lake. Growth and development in Utah County has accelerated in the past ten years. This is especially true in the northwest area of the county north of Utah Lake and west of I-15 where two new cities, Eagle Mountain and Saratoga Springs, have been established within the past few years. This area of Utah County contains large quantities of undeveloped land and regional forecasts indicate that substantial population and employment growth will occur in this area well into the future. Study area population could increase 250% to over 175,000 people by the planning year 2030.

Up to the NVCS, only local master plans attempted to address transportation needs associated with the projected growth. However, these plans only concentrated on local transportation issues. No significant studies had been done to document the regional transportation related effects of the growth in this area of the county. The NVCS was undertaken to address these transportation related effects and needs of growth in northwest Utah County.

The results of the transportation and growth analyses done as part of the NVCS indicated the need to preserve three major east-west transportation corridors in order to meet the long term east-west transportation demand projected to occur in the study area. Several potential corridor alignments were developed. They were then evaluated and refined based on their impacts and benefits relating to the study area transportation system, environmental constraints, socio-economic impacts, and cost. The three preferred alternatives have been termed:

- North Recommended Corridor (Lehi 2100 North/Saratoga Springs 11600 West)
- Central Recommended Corridor (American Fork Main Street/Lehi 1000 South
- South Recommended Corridor (North Lake Road)

The South Corridor in the long range transportation plan is not listed separately, but is assumed to be a part of the Western Transportation Corridor (WTC) project when it is constructed. The WTC is listed in the plan as an illustrative project since funding has yet to be identified for it.

RECOMMENDED NORTH VALLEY CONNECTOR ROADS

INTER-REGIONAL CORRIDOR ALTERNATIVES ANALYSIS

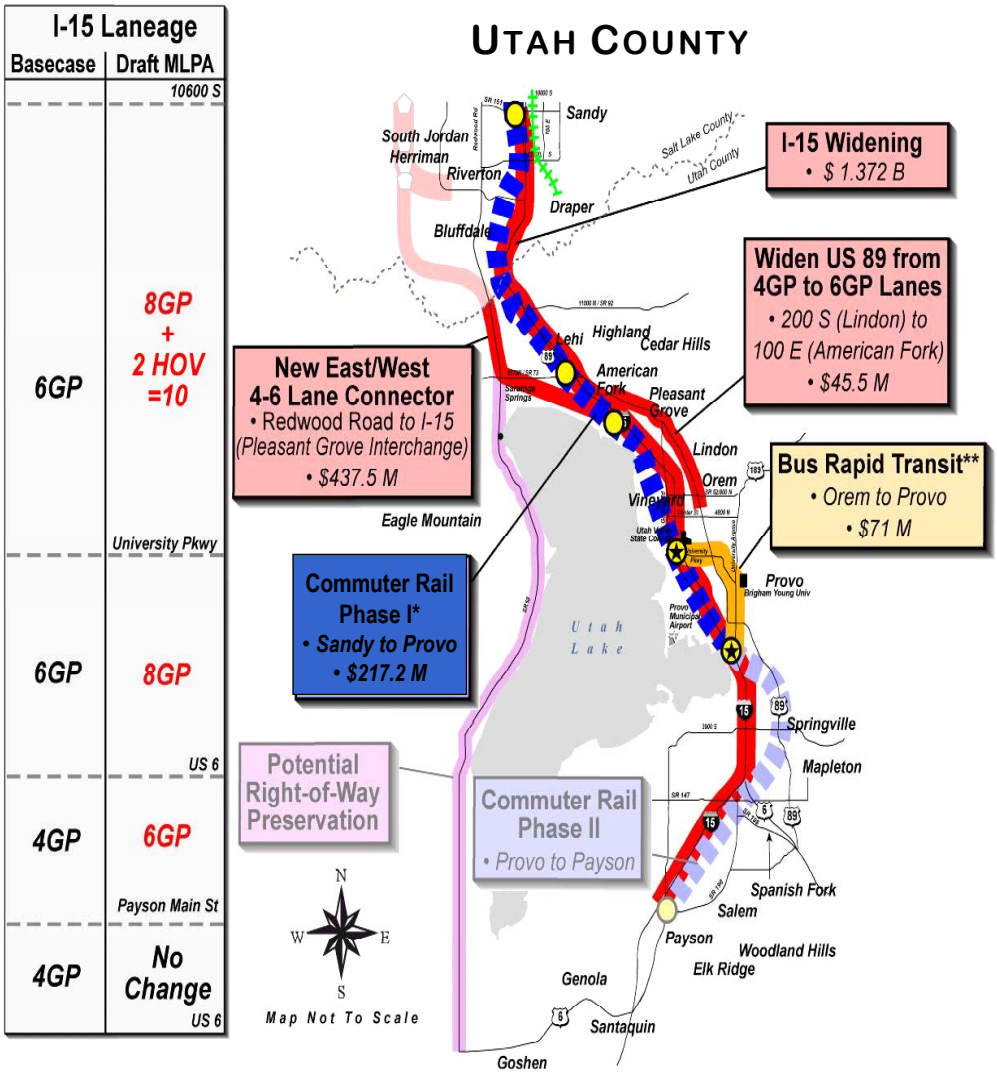
I-15 serves as the major transportation backbone through Utah County and either passes through or adjoins ten of the twenty-three communities in Utah County. The recently completed Inter-Regional Corridor Alternatives Analysis (IRCAA) Study provides an in-depth multi-modal analysis of future commuter transportation needs throughout the area, from Brigham City to the north and Santaquin to the south. The Study analyzed and made recommendations with respect to Commuter Rail, Bus Rapid Transit, High Occupancy Vehicle (HOV) lanes, general freeway, and no-freeway improvements. The Long Range Plan generally adopts the recommendations of IRCAA and incorporates them herein as specific projects. This section will only touch lightly on I-15 inability to meet future travel needs in its present configuration and describe what improvements are included in the plan to address those needs.

Recent travel model analyses show that I-15 in Utah County could begin to fail as early as 2010 if there are no improvements made. I-15 shows severe congestion from Provo Center Street Interchange to the Point of the Mountain during the p.m. peak travel period. It also shows the same condition for the portion of the freeway between the Springville Interchanges.

In order to correct these future deficiencies on I-15, the IRCAA Study recommends the implementation of commuter rail service from Provo to Salt Lake City, as well as other transit improvements. In addition it recommends that I-15 be expanded from six to ten lanes from the University Ave Interchange northward into Salt Lake County. Two of the ten lanes would be HOV lanes. An expansion form six to eight lane is recommended for University Ave to Spanish Fork's US-6 Interchange (Moark Diagonal). The resent four-lane facility from Spanish Fork to Payson would be expanded to six lanes. These improvements would be implemented over the period form 2007-2030. The map shows the Locally Preferred Alternative choose by the elected official in Utah County.

LOCALLY PREFERRED ALTERNATIVE

UTAH COUNTY



HIGHWAY AND ROADWAY PROJECTS

Highway and roadway projects listed in the long range plan as follows; Phase 1, 2003-2010; Phase 2, 2011-2020; Phase 3, 2021-2030. Phasing the projects aligns them with air quality regulations which require air quality horizon years to be modeled to identify impacts to air quality. Projects must also be fiscally constrained in each of the funding horizon years. As addressed earlier in this chapter, the Functional Classified Road System projects, excluding I-15 and the Western Transportation Corridor, are each listed in the phase when the improvements are needed. To achieve the construction of these corridors when planned relies heavily on local, state, and federal funds to be programmed and distributed as outlined in the financial plan.

The freeway projects proposed in the long range plan are not adequate for the projected growth in population, employment, and vehicle miles traveled. A lack of projected available revenue to fund Utah County highway needs is the main contributor of this deficit. I-15 reconstruction can not be accomplished in the timeframe that was recommended in the Utah County I-15 Corridor Management Plan. The Corridor Management Plan also outlined the maintenance and congestion issues along the interstate. Congestion is the major impetus in adding capacity to the facility. Traffic modeling shows that I-15 will reach gridlock during p.m. peak hours (4 to 6 p.m.) between the Salt Lake County line and Orem by 2007. The Corridor Management Plan recommends this portion of freeway be reconstructed before 2010. The long range plan, due to funding constraints lists only the section from the Salt Lake / Utah County line to American Fork Main Street by 2020 with the remainder, from American Fork to US-6/Spanish Fork Main Street by 2030. South of Spanish Fork, the interstate becomes an illustrative project (not funded). Lack of funding for the mainline freeway in Utah County will eventually paralyze the day to day functions of the traveling and commuting public, limit economic growth, and detour interstate commerce. Heavy congestion on Utah County I-15 is a statewide problem and funding limitations must be addressed.

The projected available funding for the plan is applied to allow proper operations, maintenance, preservation needs, and new capacity projects on the Functionally Classified Road System. As stated above, the majority of Utah County I-15 reconstruction cannot be done before 2030 due to the lack of funding. The Western Transportation Corridor in north Utah County is also an illustrative project even though it should be constructed by 2030. To be able to project adequate revenue to fund these needed projects before 2030, will require a thorough look at how transportation funding is allocated. This will require action by the legislature to address solutions to the congestion problems

HIGHWAY AND ROADWAY PROJECTS

FREEWAY

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1 2003-2010							
FWY-1.1	**I-15 Freeway - Lehi** Salt Lake Co Line to Lehi 3500 North	Add 2 GP Lanes Center Median	Freeway	I-15	200	2.3	$9.4 m
FWY-1.2	**I-15/Springville 1400 North Interchange**	Reconstruct Interchange New Capacity - Bridge/Ramps	Freeway	I-15/ SR-75	-	-	$16.6 m
PHASE 2 2011-2020							
FWY-2.1	**I-15 Freeway - Lehi to American Fork** Salt Lake Co Line to American Fork Main Street	Reconstruction 8 GP Lanes HOV Lanes	Freeway	I-15	200	7.7	$457.5 m
FWY-2.2	**I-15/Springville 400 South Interchange**	Reconstruct Interchange New Capacity - Bridge/Ramps	Freeway	I-15/ SR-77	-	-	$21.4 m
FWY-2.3	**I-15/US-6/Spanish Fork Main St Interchange**	Reconstruct Interchange New Capacity - Bridge/Ramps	Freeway	I-15/ US-6	-	-	$42.1 m
PHASE 3 2021-2030							
FWY-3.1	**I-15/Lehi 300 West/500 West Interchange**	New Interchange	Freeway	I-15	-	-	$38.3 m
FWY-3.2	**I-15 Freeway - American Fork to Orem** American Fork Main Street to Orem University Parkway	Reconstruction 8 GP Lanes HOV Lanes	Freeway	I-15	200	10.1	$844.6 m
FWY-3.3	**I-15 Freeway - Orem to Provo** University Parkway to University Ave	Reconstruction 8 GP Lanes	Freeway	I-15	201	5.6	$424.2 m
FWY-3.4	**I-15 Freeway - Orem to Provo** University Parkway to Provo 920 South	Collector Distributor	Freeway	I-15	200	5.2	$380.7 m
FWY-3.5	**I-15 Freeway - Provo to Spanish Fork** University Ave to US-6/Spanish Fork Main Street	Reconstruction 8 GP Lanes	Freeway	I-15	200	5.8	$272.3 m
FWY-3.6	**I-15/Utah County 8000 South Interchange**	Reconstruct InterchangeNew Capacity - Bridge/Ramps	Freeway	I-15/ SR-164	-	-	$38.3 m
FWY-3.7	**I-15/Payson Main Street Interchange**	Reconstruct Interchange New Capacity - Bridge/Ramps	Freeway	I-15/ SR-115	-	-	$38.3 m
FWY-3.8	**I-15/Payson 800 South Interchange**	Reconstruct Interchange New Capacity - Bridge/Ramps	Freeway	I-15/ SR-178	-	-	$28.7 m
ILLUSTRATIVE (NO FUNDING IDENTIFIED)							
ILL-0.1	**I-15 Freeway - Spanish Fork to Payson** US-6/Spanish Fork Main Street to Payson 800 South	Reconstruction 6 GP Lanes	Freeway	I-15	200	11.4	$0.0
ILL-0.2	**I-15 Freeway - Payson to Santaquin** Payson 800 South to Juab Co Line	Rebuild bridges/ interchanges	Freeway	I-15	-	-	$0.0
ILL-0.3	**Western Transportation Corridor - Lehi to Pleasant Grove** Salt Lake County Line to I-15 Pleasant Grove	New Freeway	Freeway	-	328	11.0	$0.0

STATE HIGHWAYS

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1 2003-2010							
HWY-1.1	**American Fork Main Street** State Road to I-15	Addtl lanes - Total 4 lanes - Sidewalk/ Bike lane	Principal Arterial	SR-145	110	0.4	$1.8 m
HWY-1.2	**American Fork Main Street/ Lehi 1000 South** I-15 to Redwood Rd	New road - 4 lanes Sidewalk/Bike lane	Principal Arterial	New	106	5.0	$53.7 m
HWY-1.3	**Geneva Road** - Provo to Pleasant Grove Provo Center Street to Pleasant Grove State Street	Addtl lanes/New RR bridge Total 4 lanes - 10' Trail	Minor Arterial	SR-114	110	9.0	$39.5 m
HWY-1.4	**Lehi 2100 North/Saratoga Springs 11600 West** I-15 to Cedar Fort Hwy/SR-73	New road - 4 lanes Sidewalk	Minor Arterial	New	120	5.2	$48.7 m
HWY-1.5	**SR-92-Lehi 3500 North/Highland 11000 North** I-15 to Canyon Road	Addtl lanes - Total 4 lanes - 10' Trail	Minor Arterial	SR-92	84	6.6	$20.4 m
HWY-1.6	**Orem 800 North** I-15 to University Ave	Addtl lanes - Total 6 lanes - 10' Trail	Principal Arterial	SR-52	125	3.7	$46.1 m
HWY-1.7	**Payson Main Street** I-15 to Payson 100 North	Addtl lanes - Total 4 lanes - Sidewalk/ Bike Lane	Minor Arterial	SR-115	84	0.7	$2.6 m
HWY-1.8	**Pleasant Grove 100 East** State St to Pleasant Grove 2600 North	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-146	84	2.4	$8.8 m
HWY-1.9	**Provo Center Street** I-15 to Geneva Rd	Addtl lanes - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	SR-114	110	0.5	$2.2 m
HWY-1.10	**Redwood Rd** - Lehi to Saratoga Springs Salt Lake County Line to Cedar Fort Hwy/SR-73	Addtl lanes - Total 4 lanes - 4' min Shoulder	Minor Arterial	SR-68	110	3.8	$13.9 m
HWY-1.11	**State Road** - Spanish Fork to Salem Arrowhead Trail to Elk Ridge Drive	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-198	84	4.0	$14.5 m
HWY-1.12	**State Street** - Lindon to American Fork 200 South Lindon to 100 East American Fork	Addtl lanes/New RR bridge Total 6 lanes - Sidewalk	Principal Arterial	US-89	125	5.6	$56.1 m
HWY-1.13	**University Parkway** - Orem to Provo State Street Orem to University Ave Provo	Addtl lanes - Total 6 lanes - 10' Trail	Principal Arterial	SR-265	125	1.8	$11.0 m
HWY-1.14	**US-6** - Spanish Fork Canyon US-89 Spanish Fork to Carbon County Line	Addtl lanes - Total 4 lanes - 10' Trail	Principal Arterial	US-6	110	44.5	$96.5 m
PHASE 2 2011-2020							
HWY-2.1	**American Fork 100 East/Alpine Highway** American Fork Main Street to Highland 11000 North	Addtl lanes - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	SR-74	110	3.9	$25.5 m
HWY-2.2	**Canyon Rd** - Pleasant Grove to Highland Pleasant Grove 2600 North to Highland 11000 North	Addtl lanes - Total 4 lanes - 10' Trail	Minor Arterial	SR-146	84	2.9	$19.5 m

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 2 2011-2020 CONT'D							
HWY-2.3	**Cedar Fort Hwy** - Saratoga Springs to Eagle Mountain Redwood Rd to Eagle Mountain Blvd	Addtl lanes - Total 4 lanes - 10' Trail	Minor Arterial	SR-73	84	7.3	$34.2 m
HWY-2.4	**Orem 800 North** Geneva Road to I-15	Addtl lanes - Total 4 lanes - 10' Trail	Minor Arterial	SR-52	84	0.5	$2.3 m
HWY-2.5	**Payson 100 West** Payson Main Street to Payson 800 South	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-198	84	0.9	$4.3 m
HWY-2.6	**Provo Center Street** I-15 to Provo 500 West	Addtl lanes - Total 6 lanes - Sidewalk/Bike lane	Principal Arterial	SR-114	110	0.9	$5.7 m
HWY-2.7	**Redwood Rd** - Saratoga Springs SR-73 to Saratoga Springs South City Limit	Addtl lanes - Total 4 lanes - 4' min Shoulder	Minor Arterial	SR-68	110	8.6	$40.2 m
HWY-2.8	**Spanish Fork 300 South/Canyon Road** Spanish Fork Main Street to Spanish Fork 2000 East	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-198	84	2.2	$12.0 m
HWY-2.9	**Spanish Fork 400 North** Spanish Fork Main Street to SR-51	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-147	84	1.0	$5.4 m
HWY-2.10	**Springville 400 South** Springville 2500 West to Springville Main Street	Addtl lanes/ New RR bridge Total 4 lanes - Sidewalk	Minor Arterial	SR-77	110	2.5	$24.7 m
HWY-2.11	**Springville 1400 North** I-15 to Springville Main Street	Addtl lanes - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	SR-75	110	2.0	$20.5 m
HWY-2.12	**Springville Main Street/State Street** Springville 400 North to Provo 300 South	Addtl lanes - Total 6 lanes - Sidewalk	Principal Arterial	US-89	125	4.5	$34.1 m
HWY-2.13	**University Ave** - Provo to Orem Provo 900 South to Orem 800 North	Addtl lanes/New RR bridge Total 6 lanes - Sidewalk/Bike Lane	Principal Arterial	US-189	125	6.3	$62.9 m
HWY-2.14	**US-6** - Spanish Fork Canyon US-89 Spanish Fork to Carbon County Line	Addtl lanes - Total 4 lanes - 10' Trail	Principal Arterial	US-6	110	44.5	$255.2 m
PHASE 3 2021-2030							
HWY-3.1	**Lehi 3500 North/Highland 11000 North/SR-92** I-15 to Alpine Hwy	Addtl lanes - Total 6 lanes - 10' Trail	Minor Arterial	SR-92	110	5.6	$56.3 m
HWY-3.2	**Payson 100 North/State Road** Payson Main Street to Elk Ridge Drive	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-198	84	2.2	$16.1 m
HWY-3.3	**Provo 300 South** State Street to Provo 500 West	Addtl lanes - Total 6 lanes - Sidewalk	Principal Arterial	US-89	125	1.1	$14.9 m
HWY-3.4	**Provo 500 West** Provo 300 South to Bulldog Blvd	Addtl lanes - Total 6 lanes - Sidewalk/Bike	Principal Arterial	US-89	125	1.4	$13.8 m
HWY-3.5	**Santaquin Main St** I-15 to Summit Ridge Pkwy	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	US-6	84	1.9	$14.0 m
HWY-3.6	**Springville 400 South** I-15 to Springville Main Street	Addtl lanes - Total 6 lanes - Sidewalk	Minor Arterial	SR-77	110	1.9	$19.2 m

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 3 2021-2030 CONT'D							
HWY-3.7	**SR-51 - Spanish Fork to Springville** Spanish Fork 400 North to Springville Main Street	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	SR-51	84	3.3	$24.1 m
HWY-3.8	**University Parkway** - Orem Geneva Road to I-15	Addtl lanes - Total 6 lanes - Sidewalk	Minor Arterial	SR-265	110	0.4	$4.0 m

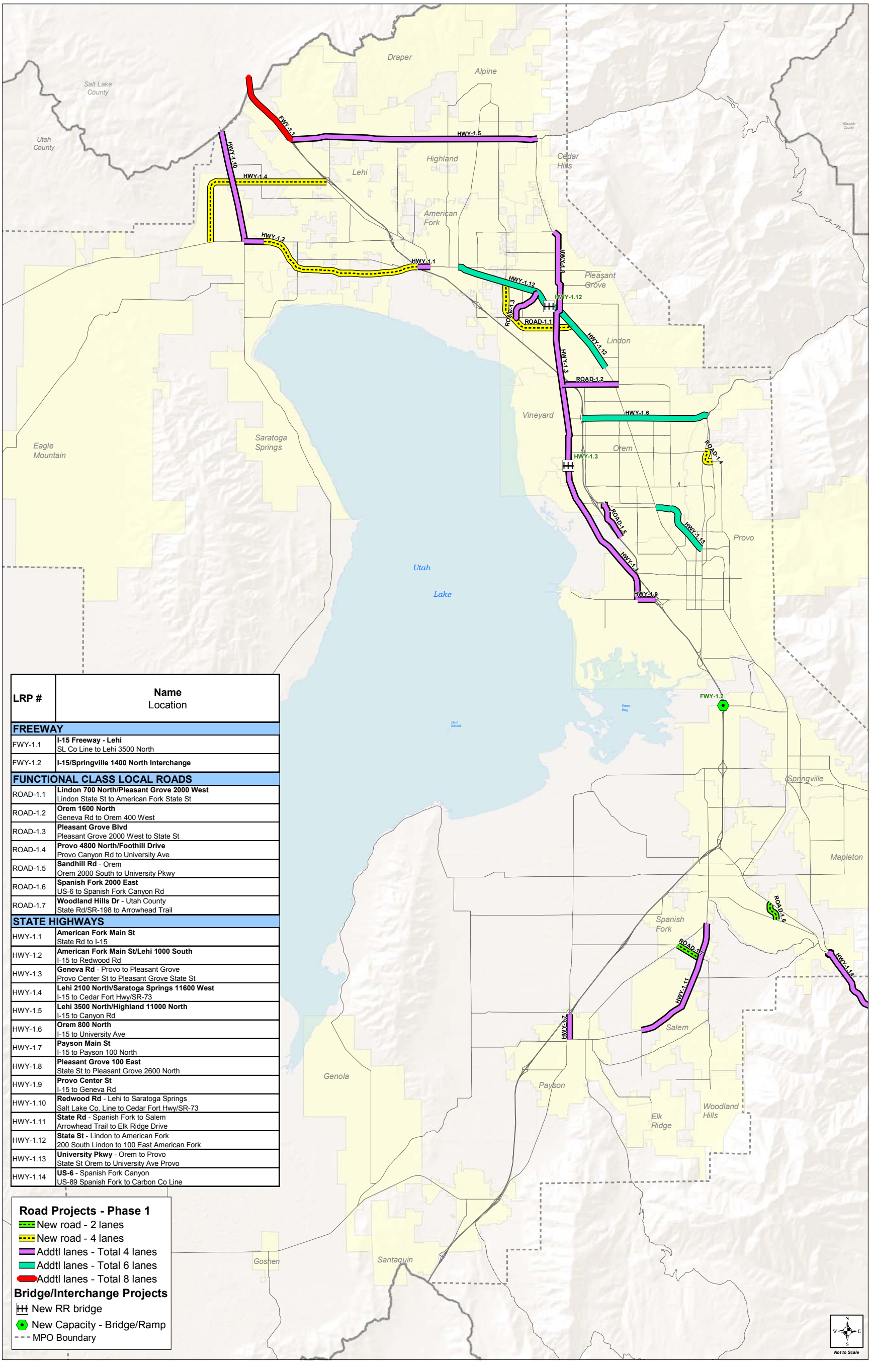
FUNCTIONAL CLASS LOCAL ROADS

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1 2003-2010							
ROAD-1.1	**Lindon 700 North/Pleasant Grove 2000 West** Lindon State St to American Fork State Street	New road - 4 lanes - Sidewalk/ Bike lane	Minor Arterial	2906	84	1.6	$13.0
ROAD-1.2	**Orem 1600 North** Geneva Road to Orem 400 West	Addtl lanes - Total 4 lanes - Sidewalk	Minor Arterial	2946	84	1.7	$7.2
ROAD-1.3	**Pleasant Grove Blvd** Pleasant Grove 2000 West to State Street	Addtl lanes - Total 4 lanes - 10' Trail	Minor Arterial	New	84	0.4	$2.0
ROAD-1.4	**Provo 4800 North/Foothill Drive** Provo Canyon Road to University Ave	New road 4 lanes - 10' Trail	Collector	3031	84	0.5	$2.4
ROAD-1.5	**Sandhill Rd** - Orem Orem 2000 South to University Pkwy	Addtl lanes - Total 4 lanes - Sidewalk	Collector	2975	84	1.1	$4.7
ROAD-1.6	**Spanish Fork 2000 East** US-6 to Spanish Fork Canyon Rd	New road 2 lanes - Sidewalk/Bike lane	Collector	3074	66	0.6	$2.3
ROAD-1.7	**Woodland Hills Dr** - Utah County State Rd/SR-198 to Arrowhead Trail	New road 2 lanes	Collector	New	66	0.8	$2.9
PHASE 2 2011-2020							
ROAD-2.1	**American Fork 100 North/Pacific Drive** State Rd to American Fork 100 East	Addtl lanes - Total 4 lanes - Sidewalk	Collector	2890	84	1.1	$6.0
ROAD-2.2	**American Fork 1100 East/Highland 4800 West** State Street to Highland 11000 North	Addtl lanes - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	2906	84	4.3	$27.7
ROAD-2.3	**Battle Creek Drive** - Pleasant Grove Pleasant Grove Blvd to Pleasant Grove 100 East	Addtl lanes - Total 4 lanes - Sidewalk	Collector	2990	84	0.8	$3.0
ROAD-2.4	**Columbia Lane** - Provo Provo 500 West to Grandview Lane	Addtl lanes - Total 4 lanes - Sidewalk	Collector	3032	84	0.4	$1.9
ROAD-2.5	**Freedom Blvd** - Provo Provo 300 South to Provo 920 South	Addtl lanes - Total 4 lanes - Sidewalk	Collector	3042	84	0.5	$2.7

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1 2011-2020 CONT'D							
ROAD-2.6	**Independence Ave** - Provo Provo 200 North to Provo 2000 North	New road/Addtl lanes Total 4 lanes - Sidewalk	Collector	2975	84	1.6	$10.0
ROAD-2.7	**Lindon 800 North/Pleasant Grove 1000 South** Lindon 1200 East to State Street	New road 2 lanes - Sidewalk/Bike lane	Collector	2966	66	2.0	$8.3
ROAD-2.8	**Orem 800 South/Provo 3700 North** Orem 800 East to Timpview Drive	Addtl lanes - Total 4 lanes Sidewalk	Collector	2974	84	1.6	$3.3
ROAD-2.9	**Orem 1200 West** Sandhill Rd to Orem 1600 North	Addtl lanes Total 4 lanes - Sidewalk	Collector	2980	84	3.9	$21.2
ROAD-2.10	**Orem 1600 North** Orem 400 West to Orem 400 East	Addtl lanes Total 4 lanes - 10' Trail	Minor Arterial	2946	84	1.0	$10.4
ROAD-2.11	**Provo 800/820 North** University Ave to Geneva Road	Addtl lanes Total 4 lanes - Sidewalk	Collector	3006	84	2.0	$9.4
ROAD-2.12	**Provo 920 South** University Ave to Provo 500 West	Addtl lanes Total 4 lanes - Sidewalk	Collector	3004	84	0.5	$2.7
ROAD-2.13	**Utah County 11200 South** Mt. Loafer Rd to Utah County 1600 West	New road 2 lanes	Collector	New	66	1.0	$4.7
PHASE 3 2021-2030							
ROAD-3.1	**American Fork 300 North/Pleasant Grove 1800 North** Pacific Drive to Pleasant Grove 100 East	Addtl lanes Total 4 lanes - Sidewalk	Collector	2900	84	3.7	$29.1
ROAD-3.2	**American Fork 500 East** State Street to American Fork 700 North	Addtl lanes Total 4 lanes - Sidewalk	Collector	2886	84	1.2	$8.8
ROAD-3.3	**American Fork 700 North/ Pleasant Grove 2600 North** American Fork 100 East to Pleasant Grove Canyon Road	Addtl lanes Total 4 lanes - Sidewalk	Collector	2894	84	2.5	$15.3
ROAD-3.4	**American Fork Main St/50 South/Pl Grove 1100 North** American Fork 500 East to Murdock Drive	Addtl lanes Total 4 lanes - Sidewalk	Collector	2896	84	3.2	$23.4
ROAD-3.5	**Battle Creek Dr** - Pleasant Grove Pleasant Grove 100 East to Murdock Canal	Addtl lanes Total 4 lanes - Sidewalk/Bike lane	Collector	2990	84	1.3	$9.6
ROAD-3.6	**Highland 4800 West/Canyon Crest Road** - Alpine Highland 11000 North to Alpine Main St	Addtl lanes Total 4 lanes - Sidewalk	Minor Arterial	2906	84	1.3	$11.3
ROAD-3.7	**Lehi 1200 East** State Rd to Lehi 3500 North	Addtl lanes Total 4 lanes - Sidewalk	Collector	2076	84	3.1	$22.6
ROAD-3.8	**Lehi 2300 West** Lehi 1900 South to Lehi Main St	New road Addtl lanes Total 4 lanes - Sidewalk/Bike	Minor Arterial	New	84	4.9	$17.8
ROAD-3.9	**Lindon 800 North/Pleasant Grove 1000 South** Lindon 1200 East to State Street	Addtl lanes Total 4 lanes - Sidewalk	Collector	2966	84	2.0	$17.2

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1 2021-2030 CONT'D							
ROAD-3.10	**Lindon 1200 East/Orem 400 East** Lindon 800 North to Orem 800 South	Addtl lanes Total 4 lanes - Sidewalk	Collector	2966	84	4.4	$29.7
ROAD-3.11	**Orem Center Street** Geneva Road to I-15	Addtl lanes Total 4 lanes - Sidewalk	Collector	2960	84	0.4	$3.4
ROAD-3.12	**Payson 600/700 North** Payson Main Street to Payson 600 East	Addtl lanes Total 4 lanes - Sidewalk	Minor Arterial	2860	84	0.5	$3.6
ROAD-3.13	**Pleasant Grove Blvd** I-15 to Pleasant Grove 2000 West	Addtl lanes Total 6 lanes - 10' Trail	Collector	2907	110	1.2	$10.2
ROAD-3.14	**Provo 200 North** Independence Ave to Provo 900 East	Addtl lanes Total 4 lanes - Sidewalk/Bike lane	Collector	3038	84	2.1	$13.2
ROAD-3.15	**Provo 500 West** Provo 300 South to Provo 920 South	Addtl lanes Total 4 lanes - Sidewalk	Collector	3034	84	0.6	$5.2
ROAD-3.16	**Provo 700 North** University Ave to Seven Peaks Blvd	Addtl lanes Total 4 lanes - Sidewalk/Bike lane	Collector	3030	84	1.3	$11.3
ROAD-3.17	**Provo Canyon Road** Provo 2230 North to Provo 3700 North	Addtl lanes - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	2040	84	1.4	$8.8
ROAD-3.18	**Spanish Fork Main Street/ Springville 2500 West** I-15 to Springville 400 South	Addtl lanes - Total 4 lanes - Sidewalk	Collector	2846	84	2.5	$18.2
ROAD-3.19	**Springville 400 East/1400 North** Springville 400 South to Springville Main Street	Addtl lanes - Total 4 lanes - Sidewalk	Collector	3084	84	1.9	$14.0
ROAD-3.20	**Springville 400 South** Springville Main St to Springville 400 East	Addtl lanes - Total 4 lanes - Sidewalk	Collector	3080	84	0.4	$2.5
ROAD-3.21	**Timpview Drive** - Provo Provo 2230 North to Quail Valley Drive	Addtl lanes - Total 4 lanes - Sidewalk	Collector	3056	84	1.3	$9.6
ILLUSTRATIVE (NO FUNDING IDENTIFIED)							
ILL-0.04	**Provo 1860 South** I-15 to Lakeshore Drive	New Road - Total 4 lanes - Sidewalk/Bike lane	Minor Arterial	NA	84	3.0	$0.0

ROADWAY MAP
PHASE 1

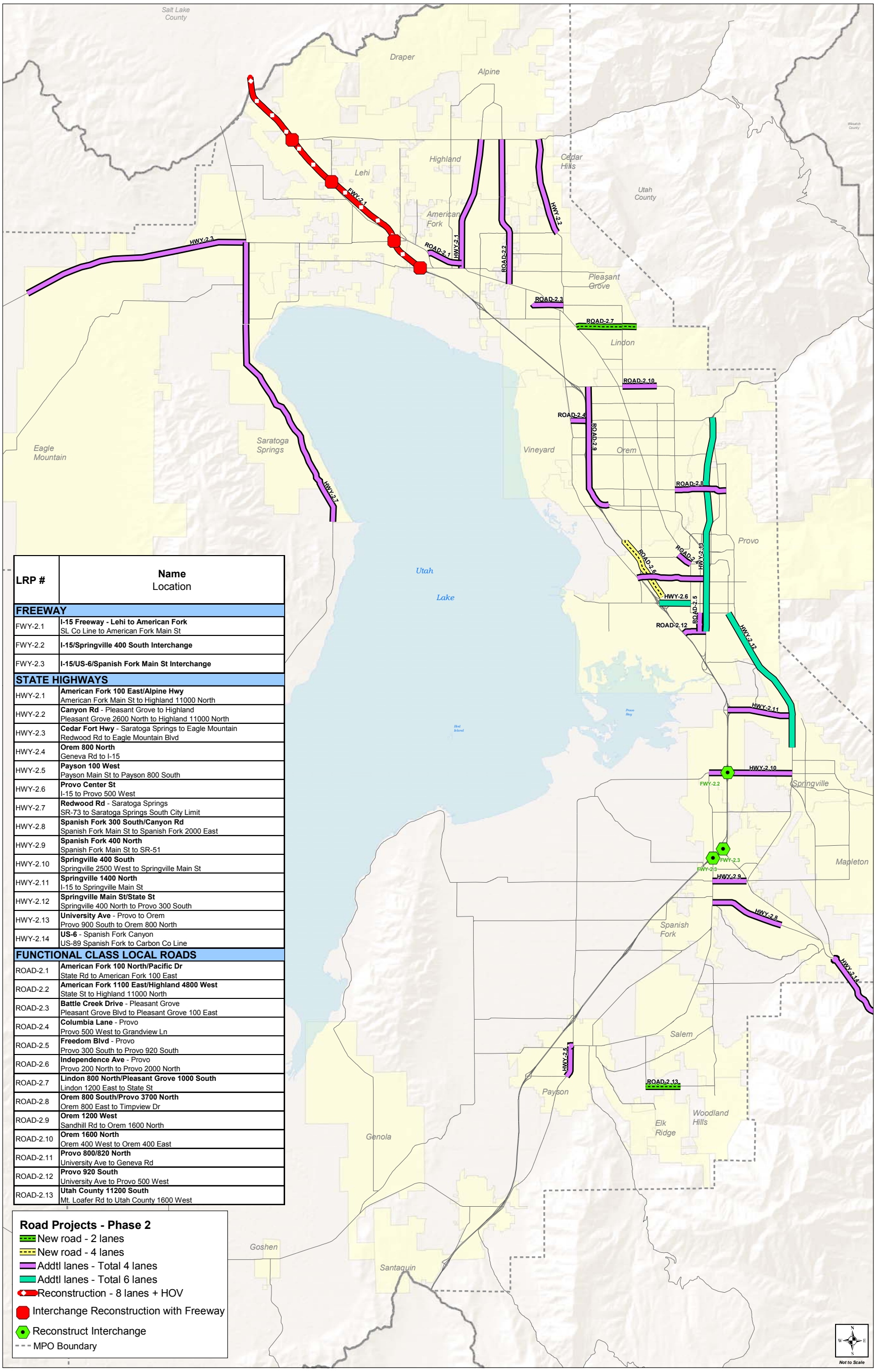


LRP #	Name Location
FREEWAY	
FWY-1.1	**I-15 Freeway - Lehi** SL Co Line to Lehi 3500 North
FWY-1.2	**I-15/Springville 1400 North Interchange**
FUNCTIONAL CLASS LOCAL ROADS	
ROAD-1.1	**Lindon 700 North/Pleasant Grove 2000 West** Lindon State St to American Fork State St
ROAD-1.2	**Orem 1600 North** Geneva Rd to Orem 400 West
ROAD-1.3	**Pleasant Grove Blvd** Pleasant Grove 2000 West to State St
ROAD-1.4	**Provo 4800 North/Foothill Drive** Provo Canyon Rd to University Ave
ROAD-1.5	**Sandhill Rd** - Orem Orem 2000 South to University Pkwy
ROAD-1.6	**Spanish Fork 2000 East** US-6 to Spanish Fork Canyon Rd
ROAD-1.7	**Woodland Hills Dr** - Utah County State Rd/SR-198 to Arrowhead Trail
STATE HIGHWAYS	
HWY-1.1	**American Fork Main St** State Rd to I-15
HWY-1.2	**American Fork Main St/Lehi 1000 South** I-15 to Redwood Rd
HWY-1.3	**Geneva Rd** - Provo to Pleasant Grove Provo Center St to Pleasant Grove State St
HWY-1.4	**Lehi 2100 North/Saratoga Springs 11600 West** I-15 to Cedar Fort Hwy/SR-73
HWY-1.5	**Lehi 3500 North/Highland 11000 North** I-15 to Canyon Rd
HWY-1.6	**Orem 800 North** I-15 to University Ave
HWY-1.7	**Payson Main St** I-15 to Payson 100 North
HWY-1.8	**Pleasant Grove 100 East** State St to Pleasant Grove 2600 North
HWY-1.9	**Provo Center St** I-15 to Geneva Rd
HWY-1.10	**Redwood Rd** - Lehi to Saratoga Springs Salt Lake Co. Line to Cedar Fort Hwy/SR-73
HWY-1.11	**State Rd** - Spanish Fork to Salem Arrowhead Trail to Elk Ridge Drive
HWY-1.12	**State St** - Lindon to American Fork 200 South Lindon to 100 East American Fork
HWY-1.13	**University Pkwy** - Orem to Provo State St Orem to University Ave Provo
HWY-1.14	**US-6** - Spanish Fork Canyon US-89 Spanish Fork to Carbon Co Line

Road Projects - Phase 1
- New road - 2 lanes
- New road - 4 lanes
- Addtl lanes - Total 4 lanes
- Addtl lanes - Total 6 lanes
- Addtl lanes - Total 8 lanes

Bridge/Interchange Projects
- New RR bridge
- New Capacity - Bridge/Ramp
- MPO Boundary

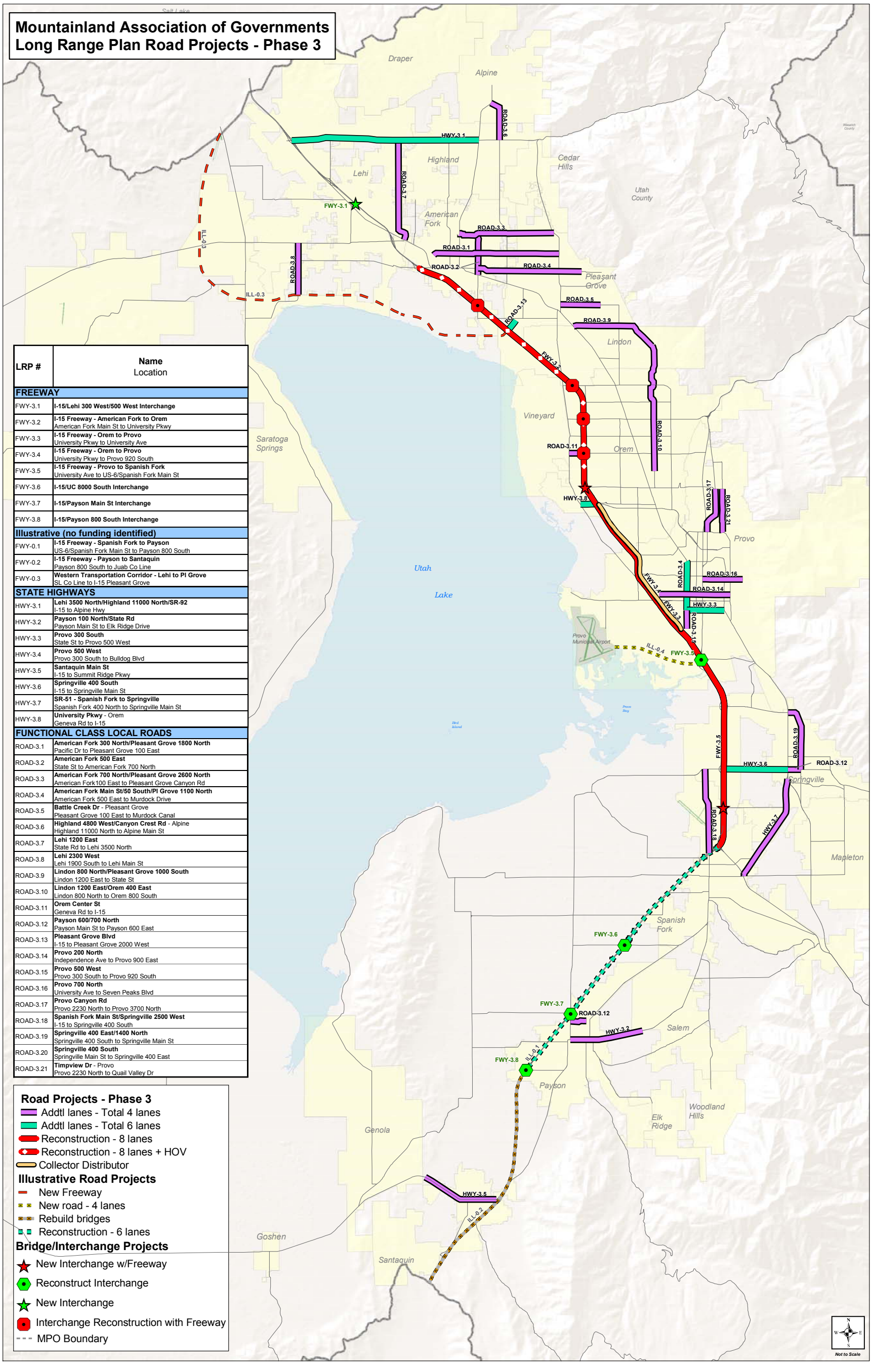
ROADWAY MAP
PHASE 2



LRP #	Name Location
FREEWAY	
FWY-2.1	**I-15 Freeway - Lehi to American Fork** SL Co Line to American Fork Main St
FWY-2.2	**I-15/Springville 400 South Interchange**
FWY-2.3	**I-15/US-6/Spanish Fork Main St Interchange**
STATE HIGHWAYS	
HWY-2.1	**American Fork 100 East/Alpine Hwy** American Fork Main St to Highland 11000 North
HWY-2.2	**Canyon Rd** - Pleasant Grove to Highland Pleasant Grove 2600 North to Highland 11000 North
HWY-2.3	**Cedar Fort Hwy** - Saratoga Springs to Eagle Mountain Redwood Rd to Eagle Mountain Blvd
HWY-2.4	**Orem 800 North** Geneva Rd to I-15
HWY-2.5	**Payson 100 West** Payson Main St to Payson 800 South
HWY-2.6	**Provo Center St** I-15 to Provo 500 West
HWY-2.7	**Redwood Rd** - Saratoga Springs SR-73 to Saratoga Springs South City Limit
HWY-2.8	**Spanish Fork 300 South/Canyon Rd** Spanish Fork Main St to Spanish Fork 2000 East
HWY-2.9	**Spanish Fork 400 North** Spanish Fork Main St to SR-51
HWY-2.10	**Springville 400 South** Springville 2500 West to Springville Main St
HWY-2.11	**Springville 1400 North** I-15 to Springville Main St
HWY-2.12	**Springville Main St/State St** Springville 400 North to Provo 300 South
HWY-2.13	**University Ave** - Provo to Orem Provo 900 South to Orem 800 North
HWY-2.14	**US-6** - Spanish Fork Canyon US-89 Spanish Fork to Carbon Co Line
FUNCTIONAL CLASS LOCAL ROADS	
ROAD-2.1	**American Fork 100 North/Pacific Dr** State Rd to American Fork 100 East
ROAD-2.2	**American Fork 1100 East/Highland 4800 West** State St to Highland 11000 North
ROAD-2.3	**Battle Creek Drive** - Pleasant Grove Pleasant Grove Blvd to Pleasant Grove 100 East
ROAD-2.4	**Columbia Lane** - Provo Provo 500 West to Grandview Ln
ROAD-2.5	**Freedom Blvd** - Provo Provo 300 South to Provo 920 South
ROAD-2.6	**Independence Ave** - Provo Provo 200 North to Provo 2000 North
ROAD-2.7	**Lindon 800 North/Pleasant Grove 1000 South** Lindon 1200 East to State St
ROAD-2.8	**Orem 800 South/Provo 3700 North** Orem 800 East to Timpview Dr
ROAD-2.9	**Orem 1200 West** Sandhill Rd to Orem 1600 North
ROAD-2.10	**Orem 1600 North** Orem 400 West to Orem 400 East
ROAD-2.11	**Provo 800/820 North** University Ave to Geneva Rd
ROAD-2.12	**Provo 920 South** University Ave to Provo 500 West
ROAD-2.13	**Utah County 11200 South** Mt. Loafer Rd to Utah County 1600 West

Road Projects - Phase 2
- New road - 2 lanes
- New road - 4 lanes
- Addtl lanes - Total 4 lanes
- Addtl lanes - Total 6 lanes
- Reconstruction - 8 lanes + HOV
- Interchange Reconstruction with Freeway
- Reconstruct Interchange
- MPO Boundary

ROADWAY MAP
PHASE 3



LRP #	Name Location
FREEWAY	
FWY-3.1	**I-15/Lehi 300 West/500 West Interchange**
FWY-3.2	**I-15 Freeway - American Fork to Orem** American Fork Main St to University Pkwy
FWY-3.3	**I-15 Freeway - Orem to Provo** University Pkwy to University Ave
FWY-3.4	**I-15 Freeway - Orem to Provo** University Pkwy to Provo 920 South
FWY-3.5	**I-15 Freeway - Provo to Spanish Fork** University Ave to US-6/Spanish Fork Main St
FWY-3.6	**I-15/UC 8000 South Interchange**
FWY-3.7	**I-15/Payson Main St Interchange**
FWY-3.8	**I-15/Payson 800 South Interchange**
Illustrative (no funding identified)	
FWY-0.1	**I-15 Freeway - Spanish Fork to Payson** US-6/Spanish Fork Main St to Payson 800 South
FWY-0.2	**I-15 Freeway - Payson to Santaquin** Payson 800 South to Juab Co Line
FWY-0.3	**Western Transportation Corridor - Lehi to Pl Grove** SL Co Line to I-15 Pleasant Grove
STATE HIGHWAYS	
HWY-3.1	**Lehi 3500 North/Highland 11000 North/SR-92** I-15 to Alpine Hwy
HWY-3.2	**Payson 100 North/State Rd** Payson Main St to Elk Ridge Drive
HWY-3.3	**Provo 300 South** State St to Provo 500 West
HWY-3.4	**Provo 500 West** Provo 300 South to Bulldog Blvd
HWY-3.5	**Santaquin Main St** I-15 to Summit Ridge Pkwy
HWY-3.6	**Springville 400 South** I-15 to Springville Main St
HWY-3.7	**SR-51 - Spanish Fork to Springville** Spanish Fork 400 North to Springville Main St
HWY-3.8	**University Pkwy** - Orem Geneva Rd to I-15
FUNCTIONAL CLASS LOCAL ROADS	
ROAD-3.1	**American Fork 300 North/Pleasant Grove 1800 North** Pacific Dr to Pleasant Grove 100 East
ROAD-3.2	**American Fork 500 East** State St to American Fork 700 North
ROAD-3.3	**American Fork 700 North/Pleasant Grove 2600 North** American Fork100 East to Pleasant Grove Canyon Rd
ROAD-3.4	**American Fork Main St/50 South/Pl Grove 1100 North** American Fork 500 East to Murdock Drive
ROAD-3.5	**Battle Creek Dr** - Pleasant Grove Pleasant Grove 100 East to Murdock Canal
ROAD-3.6	**Highland 4800 West/Canyon Crest Rd** - Alpine Highland 11000 North to Alpine Main St
ROAD-3.7	**Lehi 1200 East** State Rd to Lehi 3500 North
ROAD-3.8	**Lehi 2300 West** Lehi 1900 South to Lehi Main St
ROAD-3.9	**Lindon 800 North/Pleasant Grove 1000 South** Lindon 1200 East to State St
ROAD-3.10	**Lindon 1200 East/Orem 400 East** Lindon 800 North to Orem 800 South
ROAD-3.11	**Orem Center St** Geneva Rd to I-15
ROAD-3.12	**Payson 600/700 North** Payson Main St to Payson 600 East
ROAD-3.13	**Pleasant Grove Blvd** I-15 to Pleasant Grove 2000 West
ROAD-3.14	**Provo 200 North** Independence Ave to Provo 900 East
ROAD-3.15	**Provo 500 West** Provo 300 South to Provo 920 South
ROAD-3.16	**Provo 700 North** University Ave to Seven Peaks Blvd
ROAD-3.17	**Provo Canyon Rd** Provo 2230 North to Provo 3700 North
ROAD-3.18	**Spanish Fork Main St/Springville 2500 West** I-15 to Springville 400 South
ROAD-3.19	**Springville 400 East/1400 North** Springville 400 South to Springville Main St
ROAD-3.20	**Springville 400 South** Springville Main St to Springville 400 East
ROAD-3.21	**Timpview Dr** - Provo Provo 2230 North to Quail Valley Dr

Road Projects - Phase 3
- Addtl lanes - Total 4 lanes
- Addtl lanes - Total 6 lanes
- Reconstruction - 8 lanes
- Reconstruction - 8 lanes + HOV
- Collector Distributor

Illustrative Road Projects
- New Freeway
- New road - 4 lanes
- Rebuild bridges
- Reconstruction - 6 lanes

Bridge/Interchange Projects
- New Interchange w/Freeway
- Reconstruct Interchange
- New Interchange
- Interchange Reconstruction with Freeway
- MPO Boundary

PRINCIPAL CORRIDORS

This section of the Long Range Plan is intended to describe the configuration and attributes of the principal arterial corridors within the Utah County area and what improvements are to be made to the corridors within the Long Range Plan horizon.

US-89 / STATE STREET

- **Lehi through American Fork**: Currently there is no congestion on this segment of State Street. Initially, this road was built as the only connection from Utah County to Salt Lake County. As I-15 is now functioning in that role there is excess capacity for traffic volume in this segment. There are no plans for improvements here except for when it meets I-15 in the north. The North Valley Connectors study recommended a north corridor that would tie into the same north interchange with I-15.

- **American Fork through Lindon:** This segment is the major north/south arterial road in the north part of the county. There are two bottlenecks that restrict the flow of traffic. The first is at the American Fork Main Street Connection to I-15 where the road narrows to two lanes at the intersection. The second location is where the former Union Pacific tracks bridge State Street in Pleasant Grove again narrowing to two lanes. The Long Range Plan recommends adding capacity to six lanes and replacing the Pleasant Grove railroad bridge.

- **Orem and Provo:** This road is the major north / south corridor through the urban area. The road is already built out to a six lane configuration. There are no more plans for further expansion of this facility. Instead congestion management methods and ITS infrastructure along with transit improvements will be used to mitigate the high traffic volumes.

- **500 West Provo:** This segment is from 300 South to Bull Dog and is currently at four lanes through the area. It is one of the more congested roads in the area. The Long Range Plan proposes to expand this segment to a six lane facility. Other improvements would include ITS, transit, and further congestion management study.

- **300 South Provo:** Currently at four lanes and experiences minimal congestion. Improvements are expected to be toward the end of the Long Range Plan horizon widening to a six lane facility.

- **South State Street / Springville Main:** Through Provo to Springville this is a four lane highway and in Springville it is a four lane surface street. Congestion is becoming an issue as this is one of the two corridors connecting south county to the central county. Proposed changes are to increase it to six lanes and add ITS improvements.

- **Through Mapleton:** In this segment 89 acts as a two lane rural highway connecting to Spanish Fork canyon. No improvements are proposed.

800 NORTH, OREM

This is a major corridor connecting I-15 to Provo Canyon which provides access east of the Wasatch mountain range. There is significant congestion primarily at major intersections including State Street. Currently 800 North is a four lane facility while the model proposes a six lane configuration. Environmental work is currently being done.

UNIVERSITY PARKWAY

This is a major east/ west arterial road between Provo and Orem connecting both cities to I-15. It is a

highly commercial corridor with limited access to adjacent businesses. Major intersections are highly congested. The parkway has a six lane configuration in Orem and four lanes in Provo. The college connector trail, which runs parallel to the parkway, was recently completed thereby adding a bike and pedestrian option for travel and recreation along this corridor.

Long Range plan improvements for University Parkway include widening the entire corridor to six lanes, improving trail access, and adding a Bus Rapid Transit (BRT) facility. As with other major corridors ITS, congestion management, and improved transit will be used to further mitigate congestion.

US-189 / PROVO CANYON

The improvements for this corridor are complete in Utah County. It is a four lane facility which is a major connection for through trips or freight in and out of Utah County to the northeast part of the state. Future needed improvements are outside Utah County to Heber City. This corridor is important in terms of freight movement and access to recreation points including Deer Creek Reservoir.

PROVO CENTER STREET (FROM I-15 TO 500 WEST)

This is a major connection from downtown Provo to I-15. It is highly congested and has two lanes heading eastbound and three lanes heading westbound toward I-15. It is proposed to make the corridor a six lane facility. The connection with I-15 will be rebuilt as part of the recommended I-15 reconstruction.

US-6 - SPANISH FORK CANYON

This corridor serves as a major connection to the south/east part of the state through Utah County. It provides a connection to I-70 from I-15 which is high utilized for both freight and recreation. Most of the Spanish Fork City portion is four lanes then in the canyon it is two lanes with some passing areas expanding to four lanes. There are numerous safety concerns with this corridor.

Recently the US-6 Safety Improvement Study was completed on this corridor to determine the safety improvements needed for the entire corridor. A future environment study will determine project priorities.

SPANISH FORK MAIN STREET

This is a four lane facility and it has a congestion problem mainly at the I-15 interchange. This will be addressed with the I-15 rebuild. The only other improvements planned for the corridor would be ITS, congestion management, and transit improvements.

REDWOOD ROAD

While not a principal corridor, it will become one in the near future. It is one of two connections Utah County has to Salt Lake County. With the growth in the south part of Salt Lake County and simultaneous growth in the north part of Utah County, this corridor will play a critical role in the development in that area. It is proposed that this part of Redwood Road become a four lane facility in this area.

LEHI MAIN STREET (SR-73)

This corridor is the primary access for Eagle Mountain, Saratoga Springs, and West Lehi to I-15. It is a four lane road from I-15 to 500 East and then a two lane road from there to Redwood Road. It travels through Lehi's historic town center, which has numerous driveway accesses and on-street parking.

Due to future growth west of Lehi and their desire to access I-15 and Lehi's commercial centers, Main Street will only continue to increase in congestion. A north valley corridors study was completed to

address these concerns. The study identified three potential corridors in Lehi: one at 2100 North, one along 1000 South, and one that skirts the north portion of Utah Lake. These corridors could be built as arterials with the potential to be expanded to provide a freeway to freeway connection were the Western Transportation Corridor to enter Utah County to connect to I-15.

UNIVERSITY AVENUE

This principal corridor is a main thoroughfare through Provo providing important access to BYU, major shopping centers, East Bay, and downtown Provo. This is also an alternative route to south Utah County from both Orem and Provo. There is access to Provo Canyon and the north eastern portion of the state and is one of the major truck routes through Utah County.

University Avenue is currently six lanes south of 920 South, Provo and four lanes to the north. It is proposed to make the entire length six lanes. This widening would include reconstruction of the viaduct over the railroad tracks in Provo.

A Bus Rapid (BRT) Transit system is proposed for the south part of University Avenue. This BRT system could occupy one or possibly two lanes along this portion of the corridor. It has yet to be determined if these lanes would be shared traffic lanes or dedicated BRT lanes. A BRT system would have a significant impact in relieving traffic congestion.

SR-92

This corridor is not a principal corridor but is an important two-lane connection between I-15 and the northeast cities of Alpine, Lehi, and Highland. Growth has occurred in this area causing this road to become very congested. It is proposed to make this a four lane highway by adding two additional lanes between I-15 and Canyon Road/SR-146.

Major developments are expected along this corridor and access from the Suncrest development, located on the top of Traverse Mountain, desires to connect with SR-92 for access to Utah County.

The current Transportation Improvement Program has money programmed to conduct an Environmental Study on this corridor, which will look at widening of this road along with the potential for grade separating a railroad crossing near the I-15 interchange.

GENEVA ROAD

This corridor also is not a principal corridor in classification but is an important north/south corridor through the Provo/Orem area; it has become an increasingly important alternative to I-15 and State Street through the central part of Utah County.

It is proposed to increase this road from two to a four lane and to grade separate this road from the railroad tracks at 400 South in Orem.

CONGESTION MANAGEMENT

The most congested corridors have been identified from the Mountainland travel demand model. Model runs were made using 2005 socio-economic data and existing plus committed transportation network to give an indication of existing and near-term congested locations in the valley. The results of this analysis are shown in the following table.

MOST CONGESTED CORRIDORS IN THE MPO

	Road	Route	To / From	Volume/Capacity Mid-day	Volume/Capacity P.M. Peak
1	Main Street, Lehi	SR-73	I-15 to Redwood Road (SR-68)	1.41	1.99
2	Geneva Road	SR-114	State Street, Pleasant Grove to 1600 North, Orem	1.42	1.87
3	Main Street, Spanish Fork	SR-156	I-15 to Arrowhead Trail	0.89	1.81
4	Main Street, Payson	SR-115	I-15 to 100 North	1.41	1.80
5	Main Street, American Fork	US-89 / SR-145	I-15 to 100 East	1.11	1.79
6	University Parkway	SR-265	800 East, Orem to Canyon Road, Provo	1.06	1.77
7	University Ave	US-189	I-15 to 2600 North, Provo	1.06	1.66
8	Canyon Road / 100 East, Pleasant Grove	SR-146	State Street to 2600 North, Pleasant Grove	0.87	1.54
9	500 West, Provo	US-89	Bulldog Blvd to 300 South, Provo	1.30	1.52
10	State Street	US-89	100 East, American Fork to 200 South, Lindon	1.21	1.50

Also, noteworthy for their regional significance are I-15 and Redwood Road. The model indicates that I-15 from Salt Lake County Line to University Parkway, Orem will see heavy congestion (volume/capacity up to 1.49) along segments of the facility. Congestion issues for I-15, however, are being considered as part of the Utah County I-15 Corridor Management Plan study was completed July 2002. Redwood Road is also expected to have a high volume to capacity ratio (between 1.45 and 1.49).

CMS EVALUATION RESULTS

Focus was given to three of the congested corridors for further evaluation and study. This evaluation first identified the cause of congestion and then looked at congestion management strategies based on the CMS methodology that would be needed to mitigate the congestion. Actions planned or currently being undertaken to alleviate congestion on the corridor were also identified. The three corridors are listed below.

Lehi Main Street SR-73 - I-15 to Redwood Road SR-68

Cause of Congestion: Lehi Main Street is a 4-lane facility from I-15 to 500 East, Lehi (about 0.5 miles) and a 2-lane facility form 500 East to Redwood Road. It goes through the heart of Lehi's historic district and has many driveway accesses and on-street parking locations.

Lehi Main Street serves as the main connection to I-15 for Lehi, Eagle Mountain, Saratoga Strings, and Cedar Fort. Due to the rapid growth in West Lehi, Eagle Mountain, and Saratoga Springs the volume of traffic desiring access to I-15 and Lehi's historic district has rapidly surpassed the available capacity of the road. The continued growth forecast for these areas appear to only further aggravate the congestion on Lehi Main Street in the future.

CMS Recommendations: Due to the very high demand for travel on Lehi Main Street, congestion management strategies alone cannot reduce demand sufficiently to alleviate the congestion problem; extra capacity will be needed. Because of Lehi's historic district, it is not feasible to widen Main Street to provide the necessary capacity to meet existing and future traffic demand. Constructing alternate east/west routes to bypass Lehi Main Street thus reducing the demand on Main Street is warranted.

Mountainland in conjunction with UDOT completed the North Valley Connectors Study in January 2002. This study identified three east/west corridors in northwest Utah County that would serve as to bypass Lehi Main Street. These corridors will help reduce the demand on Lehi Main Street and provide for greater east/west movement in this area. However, although additional capacity is warranted, the following congestion management strategies still need to be considered to improve and maintain traffic flow on Lehi Main Street and on any new road to be built:

- Transit and Park and Ride options
- Driveway access management strategies
- Left and right turn pockets and or center turn lanes
- ITS Conduit installed as part of new construction
- Traffic signal interconnect and coordination project
- Placement of new traffic signals
- On-street parking restrictions

Main Street, American Fork US-89 - I-15 to 100 East

Cause of Congestion: Congestion on this corridor is due to two bottlenecks: American Fork Main Street necks down to a 2-lane facility on the small segment between State Street/US-89 and the northbound I-15 on/off ramps. During peak times, this narrow part of the corridor has the propensity to become congested. As well, the intersection of Main Street and 100 East becomes a source of potential problems during peak demand periods from the high volumes flowing between 100 East and Main Street. With 100 East being designated part of the Alpine Highway, a north/south arterial; there is a high demand for connection to this road. The large turning volumes in addition to the high thru demand on Main Street create a bottleneck at this location.

CMS Recommendations: Because of the very limited capacity on American Fork Main Street between I-15 and State Street/US-89, the lack of viable alternate routes, and high volume of traffic desiring to access the freeway utilize this road. Congestion management strategies alone cannot reduce demand sufficiently to alleviate the congestion problem, hence extra capacity will be needed. Widening this section of Main Street is warranted. Any road widening project undertaken should be coordinated with freeway improvement recommendations outlined in the Utah County I-15 Corridor Management Plan and should include ITS conduit and any ITS elements outlined in Mountainland's ITS plans as part of the project.

Intersection improvements are recommended to help alleviate congestion at American Fork Main Street and 100 East bottleneck. These improvements could include items such as double-left turn lanes on remaining legs of the intersection, right turn pockets on all legs of the intersection, and an additional lane segment from westbound Main Street to northbound 100 East. Signal coordination would also help manage traffic flow, thus helping to alleviate congestion at this intersection and the rest of the corridor. A signal interconnect project is planned in the Mountainland TIP for 2005.

In addition to the above recommendations, the American Fork Main Street Corridor should include the following congestion management strategies:

- Improved transit service and access
- Driveway access management strategies
- Right turn lanes
- ITS elements outlined in the Mountainland ITS plans
- On-street parking restrictions
- Placement of new traffic signal

University Parkway SR-265 – State Street, Orem to Canyon Road, Provo

Cause of Congestion: University Parkway runs through the heart of Utah Valley and functions as one of its main arteries. It connects two universities, serves as one of Provo's main connections to I-15, and is one of the major links between Orem and Provo. Because of the regional nature of University Parkway, high levels of thru traffic currently use this corridor, and it is expected that this thru traffic will increase in the future. In addition, this segment of University Parkway also is a major destination for trips going to the University Mall and the UTA transit center.

East of State Street, Orem, University Parkway narrows from a 7-lane facility to a 5-lane facility and continues as a 4 to 5-lane facility to University Ave, Provo. (The 4-lane segment is located on the divided portion of the road and has no center turn lane.) The travel model shows that due to the population and economic growth of the area, traffic volumes are expected to surpass the capacity of this segment. Additional congestion delays are introduced at the 800 East (Orem), 2230 North (Provo), and 200 West (Provo) intersections.

CMS Recommendations: Because of University's central location in the valley, several congestion management strategies become viable options to alleviation the congestion on this corridor. The following list illustrates the CMS strategy recommendations:

- Bus Rapid Transit
- Improve transit access and operations
- Rideshare programs for major employment centers on University Parkway or that consistently use this corridor
- Park and Ride locations
- Intersection improvements at 800 East, 2230 North, and 200 West to reduce cycle lengths
- Signal interconnect between Orem and Provo for better incident and event management
- Other ITS elements outlined in the Mountainland ITS plans
- Further analysis may show that additional capacity would be warranted (Any capacity increase or roadway expansion on University Parkway should incorporate regional transit plans such as Bus Rapid Transit or regional rail connectivity.)

INTELLIGENT TRANSPORTATION SYSTEM

The following list summarizes the ITS projects planned for the Mountainland Area. These projects are identified the Mountainland *ITS Deployment Plan* and *ITS Communications Study*. The *ITS Deployment Plan* identifies specific ITS projects based on the area's transportation needs. Consideration was given to technology usage, geographic coverage, capital costs, recurring operations, maintenance costs, and the National ITS architecture. These projects built on the foundation established in previous Mountainland ITS plans and from the needs of Mountainland ITS stakeholders. The *ITS Communications Study* identifies the communication infrastructure technology and components used to support ITS deployment. These studies can be found in their entirety on the Mountainland website. The list of projects has also been coordinated with city and state ITS plans.

ITS PROJECTS

LRP #	Name Location	Improvement	Class or Type	Route	ROW	Miles	Built By	Cost
INTELLIGENT TRANSPORTATION SYSTEM - Countywide Projects								
ITS-1	**I-15 ITS Projects** Countywide	CCTV, TMS, VMS, and Com connections	-	-	-	-	2010	$3.9 m
ITS-2	**Incident Management Expansion** I-15, 800 No. Orem, US-189 Provo Canyon, US 6 SF Canyon	Expand service to UDOT Region 3	-	-	-	-	2010	$1 m
ITS-3	**UTA ITS Projects** Countywide	APC/AVL, Com upgrade, ATIS, Fare collect modernize	-	-	-	-	2010	$5.4 m
INTELLIGENT TRANSPORTATION SYSTEM - North County Projects								
ITS-4	**American Fork ITS Projects** American Fork	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$1.5 m
ITS-5	**Lehi ITS Projects** Lehi	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$0.3 m
ITS-6	**Lindon ITS Projects** Lindon	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$0.3 m
ITS-7	**Other North County ITS Projects** North Valley	CCTV and Com connections	-	-	-	-	2010	$0.05 m
ITS-8	**Pleasant Grove ITS Projects** Pleasant Grove	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$0.5 m
INTELLIGENT TRANSPORTATION SYSTEM - Central County Projects								
ITS-9	**Orem ITS Projects** Orem	Signal and Com modernize, CCTV, VID, RR Adv Warn	-	-	-	-	2010	$2.5 m
ITS-10	**Other Central County ITS Projects** BYU, UVSC, & Mountainland	Fiber connections to BYU, UVSC, & MAG	-	-	-	-	2010	$0.1 m
ITS-11	**Provo ITS Projects** Provo	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$5 m
ITS-12	**UDOT Region 3 Traffic Control Center** Orem	Control Center, Wiring Center, Com connections	-	-	-	-	2010	$1.3 m
ITS-13	**US-189 Provo Canyon ITS Projects** Provo Canyon	RWIS, CCTV, TMS, and Com connections	-	-	-	-	2010	$0.2 m
INTELLIGENT TRANSPORTATION SYSTEM - South County Projects								
ITS-14	**Other South County ITS Projects** South County	CCTV and Com connections	-	-	-	-	2010	$0.04 m
ITS-15	**Spanish Fork Canyon ITS Projects** Spanish Fork Canyon	HAR and RWIS	-	-	-	-	2010	$0.6 m
ITS-16	**Spanish Fork ITS Projects** Spanish Fork	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$0.5 m
ITS-17	**Springville ITS Projects** Springville	Signal & Com interconnect & modernization, CCTV, VID	-	-	-	-	2010	$0.7 m

NON-MOTORIZED TRAILS AND BIKE LANES

REGIONALLY SIGNIFICANT TRAIL SELECTION PROCESS

Delphi Analysis Process: Cities and Utah County planning staff and a citizen's advisory committee gathered for several planning charrettes and were encouraged to identify important origins and destinations that could be accessed through non-motorize pathways. Residential, employment, school, recreation, commercial, and public areas were to be linked with an interconnecting system of pathways. Local knowledge was combined with a regional viewpoint to establish regionally significant routes. Long Range Plan highway projects are analyzed to determine opportunities for pathway inclusion with road construction, referencing the above criteria. Criteria were established to give added emphasis to routes serving one or more important functions:

1. Adopted City Trail -- Local adoption of trail routes into community general plan

2. Multi-Jurisdictional alignment -- Connects 2 or more communities

3. Connects or extends an existing trail segment

4. Dense population TAZ -- based on residential, employment, and commercial uses; population density was greater than the average MPO Traffic Analysis Zone.

5. Connects to significant destinations -- Trail intersects within ¼ mile of an employment center, school, hospital, park/recreation, social services facility, shopping, retail, commercial zoning, transit hub/park and ride lot.

BIKE LANES COMPATIBILITY ANALYSIS

Recent research in bike/automobile interaction has been combined with bicyclist survey data to create the Bicycle Compatibility Index (BCI),[1] a useful analysis tool that can help bicycle coordinators, transportation planners, traffic engineers, and others to evaluate the capability of specific roadways to properly accommodate both motorists and bicyclists. The BCI was developed and is being promoted under the direction of the Federal Highway Administration.

- *Level-of-Service:* A number of factors are considered in generating a score or "Bicycle Level-of-Service," the output of the BCI model. Some factors include roadway classification, AADT, speed, width, number of lanes, on-street parking, and others. The BCI developers suggest that that a roadway can accommodate the skill and comfort level for the average adult bicyclist at a Bicycle Level-of-Service "C," or a BCI score less than 3.40. Roadways with a LOS "D" or worse are out of the comfort and skill range of most adult bicyclists, and bike lanes on these routes should be very carefully considered.

Mountainland staff has utilized the BCI to analyze all roadway projects within the Long Range Plan. Those projects showing a bicycle LOS "C" or better are designated to have bike lanes or wide shoulders included with the project unless law or engineering judgment precludes such inclusion.

[1] D.L. Harkey, D.W. Reinfurt, M. Knuiman, and A. Sorton, *Development of the Bicycle Compatibility Index: A Level of Service Concept, Final Report,* Report No. FHWA-RD98-072, Federal Highway Administration, Washington, DC, August 1998.

ROADWAYS PROJECTS WITH ADDED BIKE LANES

LRP #	ROADWAY PROJECTS	BCI SCORE	BICYCLE LOS	COMPATIBILITY LEVEL
HWY 1.2	Main Street, American Fork	3.38	C	Moderately High
HWY 1.7	Main Street, Payson	3.05	C	Moderately High
HWY 1.9	Center Street, Provo	2.91	C	Moderately High
HWY 1.10	Redwood Road	2.85	C	Moderately High
HWY 2.6	Center Street, Provo	2.91	C	Moderately High
HWY 2.7	Redwood Road	2.85	C	Moderately High
HWY 2.11	1400 North, Springville	3.41	C	Moderately High
HWY 2.13	University Avenue, Provo	3.11	C	Moderately High
HWY 3.4	500 West, Provo	2.29	B	Very High
ROAD 1.1	700 North, Lindon	2.32	C	Moderately High
ROAD 1.5	Sandhill Road, Orem	2.62	C	Moderately High
ROAD 1.6	2000 East, Spanish Fork	1.98	B	Very High
ROAD 1.7	Woodland Hills Drive	1.94	B	Very High
ROAD 2.7	800 North, Lindon / Pleasant Grove 1000 South	3.33	C	Moderately High
ROAD 3.5	Battle Creek Drive, Pleasant Grove	2.20	B	Very High
ROAD 3.8	2300 West, Lehi	2.17	B	Very High
ROAD 3.14	200 North, Provo	2.48	C	Moderately High
ROAD 3.16	700 North, Provo	2.60	C	Moderately High
ROAD 3.17	Provo Canyon Road	2.65	C	Moderately High

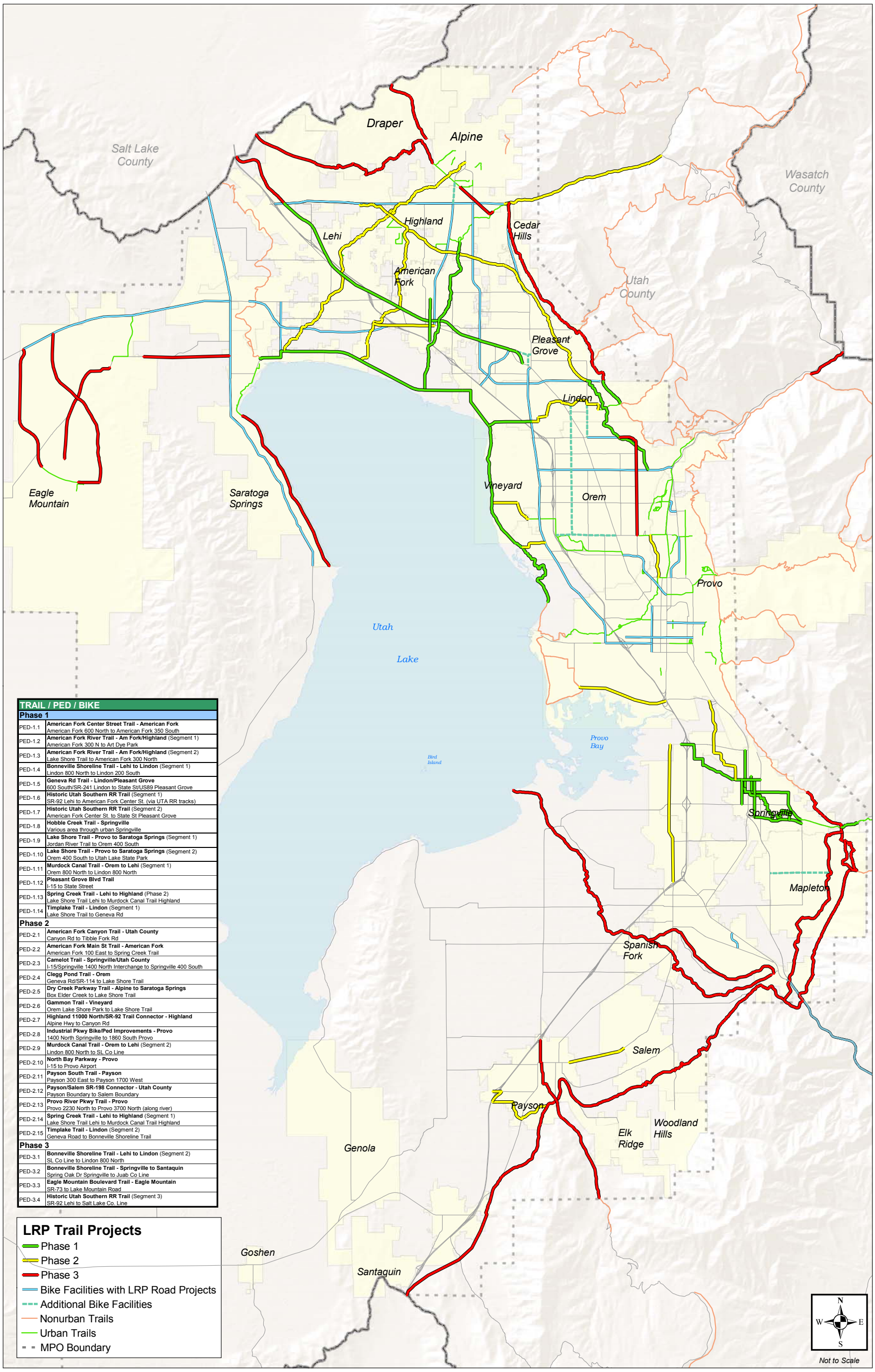
TRAIL / PEDESTRIAN / BIKE PROJECTS

LRP #	TRAIL/PEDESTRIAN/BIKE PROJECTS LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1	**2003-2010**						
PED-1.1	**American Fork Center Street Trail - American Fork** American Fork 600 North to American Fork 350 South	10' Asphalt Trail	Shared use	-	-	0.9	$0.3 m
PED-1.2	**American Fork River Trail - American Fork/Highland** (Segment 1) American Fork 300 North to Art Dye Park	10' Asphalt Trail	Shared use	-	-	0.9	$0.3 m
PED-1.3	**American Fork River Trail - American Fork/Highland** (Segment 2) Lake Shore Trail to American Fork 300 North	10' Asphalt Trail	Shared use	-	-	5.4	$1.9 m
PED-1.4	**Bonneville Shoreline Trail - Lehi to Lindon** (Segment 1) Lindon 800 North to Lindon 200 South	4' Crushed Stone Trail	Shared use	-	-	1.5	$0.1 m
PED-1.5	**Geneva Rd Trail - Lindon/Pleasant Grove** 600 South/SR-241 Lindon to State Street/ US-89 Pleasant Grove	10' Asphalt Trail	Shared use	-	-	2.2	$0.8 m
PED-1.6	**Historic Utah Southern RR Trail** (Segment 1) SR-92 Lehi to American Fork Center Street (via UTA RR tracks)	10' Asphalt Trail	Shared use	-	-	4.0	$1.4 m
PED-1.7	**Historic Utah Southern RR Trail** (Segment 2) American Fork Center Street to State Street Pleasant Grove	10' Asphalt Trail	Shared use	-	-	2.9	$1.0 m
PED-1.8	**Hobble Creek Trail - Springville** Various area through urban Springville	5' Concrete Sidewalk 6' Striped Bike Lane	Bike/Ped Improvement	-	-	3.5	$0.4 m
PED-1.9	**Lake Shore Trail - Provo to Saratoga Springs** (Segment 1) Jordan River Trail to Orem 400 South	10' Asphalt Trail	Shared use	-	-	7.5	$2.7 m
PED-1.10	**Lake Shore Trail - Provo to Saratoga Springs** (Segment 2) Orem 400 South to Utah Lake State Park	10' Asphalt Trail	Shared use	-	-	7.8	$2.8 m
PED-1.11	**Murdock Canal Trail - Orem to Lehi** (Segment 1) Orem 800 North to Lindon 800 North	10' Crushed Stone Trail	Shared use	-	-	2.0	$0.3 m
PED-1.12	**Pleasant Grove Blvd Trail** I-15 to State Street	10' Asphalt Trail	Shared use	-	-	3.3	$1.2 m
PED-1.13	**Spring Creek Trail - Lehi to Highland** (Segment 2) Lake Shore Trail Lehi to Murdock Canal Trail Highland	10' Asphalt Trail	Shared use	-	-	1.0	$0.4 m
PED-1.14	**Timplake Trail - Lindon** (Segment 1) Lake Shore Trail to Geneva Road	10' Asphalt Trail	Shared use	-	-	1.0	$0.4 m
PHASE 2	**2011-2020**						
PED-2.1	**American Fork Canyon Trail - Utah County** Canyon Road to Tibble Fork Road	5' Asphalt Trail	Shared use	-	-	5.2	$1.7 m
PED-2.2	**American Fork Main Street Trail - American Fork** American Fork 100 East to Spring Creek Trail	10' Asphalt Trail	Shared use	-	-	1.9	$0.9 m

LRP #	TRAIL/PEDESTRIAN/BIKE PROJECTS LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 2	**2011-2020 CONT'D**						
PED-2.3	**Camelot Trail - Springville/Utah County** I-15/Springville 1400 North Interchange to Springville 400 South	10' Asphalt Trail	Shared use	-	-	4.3	$2.0 m
PED-2.4	**Clegg Pond Trail - Orem** Geneva Road/SR-114 to Lake Shore Trail	10' Asphalt Trail	Shared use	-	-	0.8	$0.4 m
PED-2.5	**Dry Creek Parkway Trail - Alpine to Saratoga Springs** Box Elder Creek to Lake Shore Trail	10' Crushed Stone Trail	Shared use	-	-	10.0	$3.2 m
PED-2.6	**Gammon Trail - Vineyard** Orem Lake Shore Park to Lake Shore Trail	10' Asphalt Trail	Shared use	-	-	1.5	$0.7 m
PED-2.7	**Highland 11000 North/SR-92 Trail Connector - Highland** Alpine Hwy to Canyon Rd	10' Asphalt Trail	Shared use	-	-	1.7	$0.8 m
PED-2.8	**Industrial Pkwy Bike/Pedestrian Improvements - Provo** 1400 North Springville to 1860 South Provo	5' Concrete Sidewalk 6' Striped Bike Lane	Bike/Ped Improvement	-	-	2.7	$0.4 m
PED-2.9	**Murdock Canal Trail - Orem to Lehi** (Segment 2) Lindon 800 North to Salt Lake County Line	10' Crushed Stone Trail	Shared use	-	-	12.0	$3.8 m
PED-2.10	**North Bay Parkway - Provo** I-15 to Provo Airport	10' Asphalt Trail	Shared use	-	-	5.6	$2.6 m
PED-2.11	**Payson South Trail - Payson** Payson 300 East to Payson 1700 West	10' Asphalt Trail	Shared use	-	-	3.9	$1.8 m
PED-2.12	**Payson/Salem SR-198 Connector - Utah County** Payson Boundary to Salem Boundary	10' Asphalt Trail	Shared use	-	-	2.7	$1.3 m
PED-2.13	**Provo River Parkway Trail - Provo** Provo 2230 North to Provo 3700 North (along river)	10' Asphalt Trail	Shared use	-	-	1.4	$0.6 m
PED-2.14	**Spring Creek Trail - Lehi to Highland** (Segment 1) Lake Shore Trail Lehi to Murdock Canal Trail Highland	10' Asphalt Trail	Shared use	-	-	4.5	$2.1 m
PED-2.15	**Timplake Trail - Lindon** (Segment 2) Geneva Road to Bonneville Shoreline Trail	10' Asphalt Trail	Shared use	-	-	3.3	$1.5 m
PHASE 3	**2021-2030**						
PED-3.1	**Bonneville Shoreline Trail - Lehi to Lindon** (Segment 2) Salt Lake County Line to Lindon 800 North	4' Crushed Stone Trail	Shared use	-	-	14.6	$1.4 m
PED-3.2	**Bonneville Shoreline Trail - Springville to Santaquin** Spring Oak Dr Springville to Juab Co Line	4' Crushed Stone Trail	Shared use	-	-	27.2	$2.6 m
PED-3.3	**Eagle Mountain Boulevard Trail - Eagle Mountain** SR-73 to Lake Mountain Road	10' Asphalt Trail	Shared use	-	-	1.8	$1.1 m
PED-3.4	**Historic Utah Southern RR Trail** (Segment 3) SR-92 Lehi to Salt Lake County Line	10' Asphalt Trail	Shared use	-	-	4.0	$2.5 m
PED-3.5	**Hog Hollow Trail - Draper** Salt Lake Co line to Bonneville Shoreline Trail	10' Crushed Stone Trail	Shared use	-	-	2.3	$1.0 m
PED-3.6	**Lake Mountain Trail - Eagle Mountain** SR-73 to Eagle Mountain Blvd	10' Asphalt Trail	Shared use	-	-	3.0	$1.9 m

LRP #	TRAIL/PEDESTRIAN/BIKE PROJECTS LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 3	**2021-2030 CONT'D**						
PED-3.7	**Mapleton Lateral Canal Trail - Springville to Spanish Fork** Hobble Creek Trail Springville to Powerhouse Road Spanish Fork	10' Crushed Stone Trail	Shared use	-	-	6.4	$2.8 m
PED-3.8	**Nebo Loop Scenic Byway Trail - Payson** I-15 to Payson Canyon	10' Asphalt Trail	Shared use	-	-	3.0	$1.9 m
PED-3.9	**Orem 800 East Pathway - Orem** University Parkway to Orem 1600 North	10' Asphalt Trail	Shared use	-	-	3.0	$1.9 m
PED-3.10	**Pony Express Parkway - Eagle Mountain** Mountain Ash Way to Lake Mountain Road	10' Asphalt Trail	Shared use	-	-	4.9	$3.0 m
PED-3.11	**Pony Express Parkway - Eagle Mountain/Saratoga Springs** Redwood Road Saratoga Springs to Smith Ranch Road Eagle Mountain	10' Asphalt Trail	Shared use	-	-	13.1	$8.1 m
PED-3.12	**Provo River Parkway Trail - Utah County** Vivian Park to Wasatch County Line	10' Asphalt Trail	Shared use	-	-	5.2	$3.2 m
PED-3.13	**Scenic Ridge Trail - Spanish Fork** Powerhouse Rd to Spanish Fork River Trail	10' Asphalt Trail	Shared use	-	-	5.8	$3.6 m
PED-3.14	**Spanish Fork River Trail - Spanish Fork/Utah County** US-6 Mouth of Spanish Fork Canyon to Utah Lake	10' Asphalt Trail	Shared use	-	-	3.6	$2.2 m
PED-3.15	**West Lake Shore Trail - Saratoga Springs** Clay Pit Road to Pelican Point	10' Asphalt Trail	Shared use	-	-	6.8	$4.2 m

TRAILS AND BIKE LANES MAP



TRAIL / PED / BIKE	
Phase 1	
PED-1.1	**American Fork Center Street Trail - American Fork** American Fork 600 North to American Fork 350 South
PED-1.2	**American Fork River Trail - Am Fork/Highland** (Segment 1) American Fork 300 N to Art Dye Park
PED-1.3	**American Fork River Trail - Am Fork/Highland** (Segment 2) Lake Shore Trail to American Fork 300 North
PED-1.4	**Bonneville Shoreline Trail - Lehi to Lindon** (Segment 1) Lindon 800 North to Lindon 200 South
PED-1.5	**Geneva Rd Trail - Lindon/Pleasant Grove** 600 South/SR-241 Lindon to State St/US89 Pleasant Grove
PED-1.6	**Historic Utah Southern RR Trail** (Segment 1) SR-92 Lehi to American Fork Center St. (via UTA RR tracks)
PED-1.7	**Historic Utah Southern RR Trail** (Segment 2) American Fork Center St. to State St Pleasant Grove
PED-1.8	**Hobble Creek Trail - Springville** Various area through urban Springville
PED-1.9	**Lake Shore Trail - Provo to Saratoga Springs** (Segment 1) Jordan River Trail to Orem 400 South
PED-1.10	**Lake Shore Trail - Provo to Saratoga Springs** (Segment 2) Orem 400 South to Utah Lake State Park
PED-1.11	**Murdock Canal Trail - Orem to Lehi** (Segment 1) Orem 800 North to Lindon 800 North
PED-1.12	**Pleasant Grove Blvd Trail** I-15 to State Street
PED-1.13	**Spring Creek Trail - Lehi to Highland** (Phase 2) Lake Shore Trail Lehi to Murdock Canal Trail Highland
PED-1.14	**Timplake Trail - Lindon** (Segment 1) Lake Shore Trail to Geneva Rd
Phase 2	
PED-2.1	**American Fork Canyon Trail - Utah County** Canyon Rd to Tibble Fork Rd
PED-2.2	**American Fork Main St Trail - American Fork** American Fork 100 East to Spring Creek Trail
PED-2.3	**Camelot Trail - Springville/Utah County** I-15/Springville 1400 North Interchange to Springville 400 South
PED-2.4	**Clegg Pond Trail - Orem** Geneva Rd/SR-114 to Lake Shore Trail
PED-2.5	**Dry Creek Parkway Trail - Alpine to Saratoga Springs** Box Elder Creek to Lake Shore Trail
PED-2.6	**Gammon Trail - Vineyard** Orem Lake Shore Park to Lake Shore Trail
PED-2.7	**Highland 11000 North/SR-92 Trail Connector - Highland** Alpine Hwy to Canyon Rd
PED-2.8	**Industrial Pkwy Bike/Ped Improvements - Provo** 1400 North Springville to 1860 South Provo
PED-2.9	**Murdock Canal Trail - Orem to Lehi** (Segment 2) Lindon 800 North to SL Co Line
PED-2.10	**North Bay Parkway - Provo** I-15 to Provo Airport
PED-2.11	**Payson South Trail - Payson** Payson 300 East to Payson 1700 West
PED-2.12	**Payson/Salem SR-198 Connector - Utah County** Payson Boundary to Salem Boundary
PED-2.13	**Provo River Pkwy Trail - Provo** Provo 2230 North to Provo 3700 North (along river)
PED-2.14	**Spring Creek Trail - Lehi to Highland** (Segment 1) Lake Shore Trail Lehi to Murdock Canal Trail Highland
PED-2.15	**Timplake Trail - Lindon** (Segment 2) Geneva Road to Bonneville Shoreline Trail
Phase 3	
PED-3.1	**Bonneville Shoreline Trail - Lehi to Lindon** (Segment 2) SL Co Line to Lindon 800 North
PED-3.2	**Bonneville Shoreline Trail - Springville to Santaquin** Spring Oak Dr Springville to Juab Co Line
PED-3.3	**Eagle Mountain Boulevard Trail - Eagle Mountain** SR-73 to Lake Mountain Road
PED-3.4	**Historic Utah Southern RR Trail** (Segment 3) SR-92 Lehi to Salt Lake Co. Line

LRP Trail Projects

- Phase 1
- Phase 2
- Phase 3
- Bike Facilities with LRP Road Projects
- Additional Bike Facilities
- Nonurban Trails
- Urban Trails
- MPO Boundary

PARK AND RIDE FACILITIES

Currently there are three park and ride lots planned in the Mountainland Transportation Improvement Program: American Fork I-15 / 500 East, American Fork I-15 / Main Street, and downtown Pleasant Grove.

UTA has recently entered into a formal agreement with The Church of Jesus Christ of Latter-Day Saints to use certain church parking lots as joint use park and ride lots. UTA is required to submit an annual request stating which church parking lots they would like to use, the church reviews the list and formally grants permission. This program makes efficient use of existing facilities that are unused during the weekdays.

PARK AND RIDE PROJECT

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1	**2003-2010**						
P&R-1.1	**800 North/University Ave - Orem** Mouth of Provo Canyon	New Park & Ride Lot	Exclusive use lot	-	-	1.5	$0.7 m
P&R-1.2	**Downtown Pleasant Grove -** 200 South/UP RR	New Park & Ride Lot	Exclusive use lot	-	-	2.0	$0.9 m
P&R-1.3	**I-15/Main Street - American Fork** Northwest Corner	Expand Park & Ride Lot	Exclusive use lot	-	-	1.0	$0.9 m
P&R-1.4	**I-15/PG Interchange - American Fork** Northwest Corner	New Park & Ride Lot	Exclusive use lot	-	-	7.0	$3.1 m
PHASE 2	**2011-2020**						
P&R-2.1	**10800 West/SR-73 - Saratoga Springs** Southeast Corner	New Park & Ride Lot	Exclusive use lot	-	-	2.0	$1.1 m
P&R-2.2	**I-15/1400 North/SR-75 Interchange** Springville	New Park and Ride Lot	Exclusive use lot	-	-	3.5	$2.0 m
P&R-2.3	**I-15/1600 North Interchange - Lindon** Northeast Corner	Expand Park & Ride Lot	Exclusive use lot	-	-	1.0	$0.6 m
P&R-2.4	**I-15/400 South/SR-77 Interchange** Springville	Expand Park & Ride Lot	Exclusive use lot	-	-	2.0	$1.1 m
P&R-2.5	**I-15/800 North Interchange -** On 1200 West	Expand Park & Ride Lot	Exclusive use lot	-	-	1.5	$0.9 m
P&R-2.6	**I-15/Orem Center Street - Orem** On 1200 West	Expand Park & Ride Lot	Exclusive use lot	-	-	1.0	$0.6 m
P&R-2.7	**I-15/Provo Center Street Interchange Provo** Part of Rebuilt Interchange	New Park & Ride Lot	Exclusive use lot	-	-	4.0	$2.3 m
P&R-2.8	**I-15/Provo Collector/Distributor - Provo** Between Provo Center Street and University Parkway Orem	New Park & Ride Lot	Exclusive use lot	-	-	3.0	$1.7 m
P&R-2.9	**I-15/SR-92 Park & Ride - Lehi** On east Frontage Road	Expand Park & Ride Lot	Exclusive use lot	-	-	1.5	$0.9 m
P&R-2.10	**I-15/US-89/1200 West Interchange - Lehi** On State Road	Expand Park & Ride Lot	Exclusive use lot	-	-	3.0	$1.7 m

See the Transit Service and Park and Ride Lots Map on page 40.

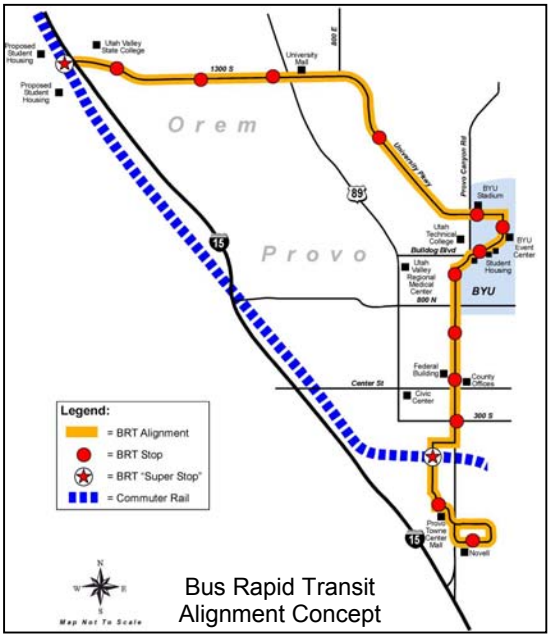
TRANSIT

Currently, Utah County population and employment is concentrated in Orem and Provo. It is expected that as population and employment grow, more areas of the county will have densities to support internal, circulating transit routes. Potential increases in local transit could come in the form of new east/west routes in Orem, additional North County routes, a more frequent South County route, more frequent service along State Street and on local circulating routes, and more frequent service on the Utah Valley/TRAX Commuter.

BUS RAPID TRANSIT

This is a new concept gaining national attention. The original idea behind BRT is to provide bus service in the image of light rail. Bus Rapid Transit (BRT) operates much like light rail with buses in designated bus lanes to avoid congestion and having traffic signal preemption to speed running times. The IRCAA Locally Preferred Alternative recommended BRT to service the heavily traveled area between Provo and Orem connecting major destination centers including Lavell Edwards Stadium, shopping malls, student housing, and the proposed intermodal centers, which will be served with future commuter rail service.

Bus Rapid Transit Proposal



Bus Rapid Transit Alignment Concept

EXPRESS BUS SERVICE

Service could be enhanced through increased frequencies or doubling headways on existing routes, reverse commute express routes, and additional articulated buses. Serving an increased number of transit trips between Salt Lake and Utah County would help reduce vehicle miles traveled and lower pollution emissions. Consequently, the high use of the express bus makes a strong contribution to air quality, the reduction of traffic congestion and lower parking demand in activity centers. The benefits of intercity bus service apply to residents and employers in both Utah and Salt Lake Counties. Residents of both counties ride the bus to and from school and job opportunities, and the entire region benefits from reduced congestion. Marginal increases in service will be possible with population growth, but more and better facilities are needed for riders to access express routes. Additional park and ride facilities along with the addition of bus/HOV lanes on I-15 would have a significant impact on travel times and would make the service more appealing to new riders.

TRANSIT CENTER

A center has been proposed for the Utah Valley State College west campus located adjacent to an existing train track, I-15, and a future park and ride lot. Other Potential transit centers include BYU Wilkinson Center, Provo's East Bay area, and North County.

INTERMODAL CENTER

An environmental study was completed in March 2000, which identified the Provo Station site at 600 South 200 West as the future intermodal site. UTA, Amtrak, local taxi companies, Greyhound Bus Lines, and bus tour operators will service the center. The intermodal center should also be built with an adjoining new park and ride lot. Once the station is built and Amtrak ridership increases, it is anticipated that more trains will serve the area. The proposed plan also includes pedestrian enhancements through the adjoining neighborhoods, bicycle facilities, mixed land use, and transit oriented development. The location will serve passengers on express buses to and from Salt Lake City and may one day include a commuter train to Salt Lake City and Ogden.

Another potential intermodal site is the proposed Utah Valley State College west campus transit center in Orem. This location works well for increased express bus service, a possible commuter rail service, and car and vanpool gathering points.

LIGHT RAIL

Light rail transit systems are about fifteen miles in length with stations every mile. They typically have averaged travel speeds of thirty miles per hour and work well in urban corridors with major destinations located near the stations. There are no travel corridors in Utah County that could currently support a major investment in light rail transit. But increased densities and population growth may make light rail transit a good future option. Right-of-way is preserved in the UTA purchase of Union Pacific corridors for future fixed guideway service.

COMMUTER RAIL

Commuter rail is a viable future option (2010-2020) for travel between Utah and Salt Lake Counties for trips of 45 miles in length or longer. Stations are spaced in five to ten mile intervals with travel speeds of fifty miles per hour or higher. One factor determining the viability of a commuter rail system is the existence of high employment opportunities along the commuter rail corridor. The 1997-1998 Commuter Rail Feasibility Study concluded that some type of improved commuter service would be feasible in the next three to ten years. The recently completed Inter-Regional Corridor Alternatives Analysis study also looked at the transportation alternatives along the I-15 corridor to see what are the most viable options for Utah County. Commuter rail is one of the alternatives being recommended, along with bus/HOV lanes on I-15 and expanded express bus service.

Proposed Commuter Rail Train

Utah Transit Authority, after years of negotiating with Union Pacific, purchased in September 2002, a corridor and operating rights that would allow for future commuter rail service from Brigham City to Payson. Included in the acquisition from Union Pacific, Utah Transit Authority acquired the UP Provo Subdivision line from the Point of the Mountain south through the State Street bridge in Pleasant Grove.

INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) is an advanced electronic and communications technologies applied to the transportation or transit industry. It provides enhanced operations, improved management of information and increased traveler information. These projects include:

- 900 MHz Radio Upgrade
- Fiber Optic Communications between facilities

- Integrated Automatic Vehicle Locators using Global Positioning Technology
- Passenger information signs
- Registering Fare Boxes with Smart Card technology
- Automatic Passenger Counters and Annunciator System

SYSTEM EXPANSION

The ability of the transit system to meet the goals set by the Long Range Transit Plan is limited by the funding available and the development patterns and characteristics of other elements of the transportation system in the community. The projected funding levels are adequate to support the current level of transit service in Utah County for the years 2003 through 2030. The projected transit revenues and costs are outlined in the following table.

The projected revenues are adequate to just meet the projected costs for the 2030 time horizon shown in this. However, funding levels would not meet the cost of increased transit service. Therefore, an increase in transit funding in Utah County is justified and would be required over the length of this plan in order to meet the goals of the Long Range Transit Plan. A referendum is proposed for the 2004 elections.

The amount of transit increase is dependant upon the willingness of the community to support higher levels of funding. In 1997, the Utah Valley Regional Planning Committee voted to support an increased transit sales tax by the year 2007. Any increase in tax, however, would have to be put to a public vote. For the purpose of estimating additional revenue from a tax increase, it is assumed that the sales tax rate in Utah County would double from one quarter to one half of one cent beginning in 2005. A rate of one half of one cent is typical of many urban transit systems in major western cities. This tax increase would provide an additional $785 million for transit in Utah County (2005-2030). The additional funding could be used to fund projects such as:

- expansion in bus fleet
- commuter rail
- BRT
- park and ride lots
- intermodal centers
- transit centers

A proposed bus fleet expansion would increase the number of buses from 64 to 96. This expansion includes the purchase of 27 regular 40' buses and 5 articulated buses. These buses could be used to expand local and express routes. An expanded bus fleet would require additional money to operate and maintain the expanded transit system, to purchase and replace the buses, and to expand the existing Timpanogos maintenance facility (needed to handle the increased number of buses). An expanded bus fleet would also generate additional revenue from fares and advertising space. These costs and additional revenues are included in the following table.

PROJECTED TRANSIT REVENUE WITH ¼ OF 1 CENT TAX INCREASE
BUS FLEET EXPANSION 2003-2030

Federal Formula Funds (5307)	$179.7 m
Federal Discretionary Bus Fund (5309)	$38.5 m
Federal New States Fund (5309)	$101.7 m
Local Sales Tax Revenue	$1.5 b
Fare Revenue	$358.9 m
Other Revenue (Advertising)	$11.6 m
TOTAL	**$2.1 b**

Tax Increase estimated to begin in 2005

PARATRANSIT SERVICE

The future of paratransit service in Utah Valley will involve change and expansion to make it more efficient and able to keep up with the increasing demand. The future Paratransit system will need to implement if the following changes.

1. Replacement of older vans in the paratransit service will help keep the system efficient. This coupled with UTA's replacing non-wheelchair lift equipped buses on it's regular route with wheelchair lift equipped ones, should allow the service to remain in compliance with ADA needs and requirements. As of April 2002 all UTA regular service buses are wheelchair lift equipped.

2. Scheduling will need to be upgraded to help keep up with future demand. Currently, all schedules are done by hand and then entered into a computer. This is a time consuming process. As demand for scheduling grows, this process will need to be changed. By purchasing computer-scheduling software, the process would be simplified.

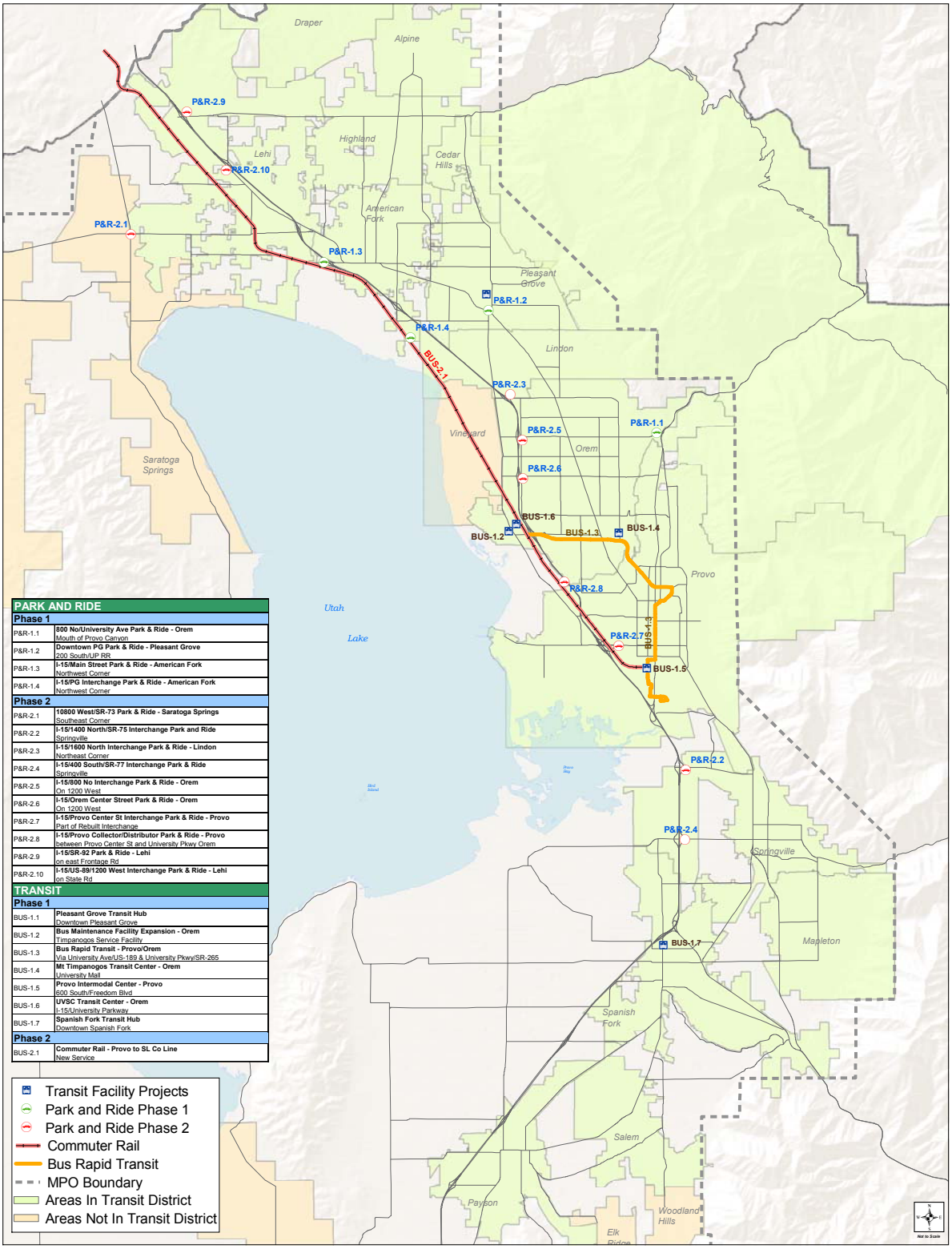
3. Smaller wheelchair lift equipped vans for paratransit service can be used for times when demand is low or on trips that are far away from the central service area. Smaller vans have a shorter life expectancy than the larger vans, but lower cost should make the smaller vans more viable.

Paratransit service in Utah Valley helps transport disabled people to places they could not normally go. It is well run by UTA, through the United Way and keeps up with passenger demand. Purchasing new and smaller vans and updating the scheduling process and software are improvement options in the Plan. Upgrading the system and implementing the changes proposed in the study will help keep Paratransit a viable service in Utah Valley.

TRANSIT PROJECTS

LRP #	NAME LOCATION	IMPROVEMENT	CLASS OR TYPE	ROUTE	ROW	MILES	COST
PHASE 1	**2003-2010**						
BUS-1.1	**Pleasant Grove Transit Hub** Downtown Pleasant Grove	New Transit Center	-	-	-	-	$2.6 m
BUS-1.2	**Bus Maintenance Facility Expansion - Orem** Timpanogos Service Facility	Expand Facility	-	-	-	-	$7.5 m
BUS-1.3	**Bus Rapid Transit - Provo/Orem** Via University Ave/US-189 & University Parkway/SR-265	Bus Rapid Transit System	-	-	-	9.0	$71.0 m
BUS-1.4	**Mt Timpanogos Transit Center - Orem** University Mall	Expand Facility	-	-	-	-	$6.2 m
BUS-1.5	**Provo Intermodal Center - Provo** 600 South/Freedom Blvd	New intermodal center	-	-	-	-	$3.9 m
BUS-1.6	**UVSC Transit Center - Orem** I-15/University Parkway	New Transit Center	-	-	-	-	$2.6 m
BUS-1.7	**Spanish Fork Transit Hub** Downtown Spanish Fork	New Transit Center	-	-	-	-	$2.6 m
PHASE 2	**2011-2020**						
BUS-2.1	**Commuter Rail - Provo to Salt Lake County Line** New Service	New Commuter Rail Line/ Facilities	-	-	-	22.0	$294.0 m

TRANSIT SERVICE AND PARK AND RIDE LOTS MAP



COMMUNITY AND ENVIRONMENTAL IMPACT ASSESSMENT

BACKGROUND AND OVERVIEW

Most of the communities in Utah County have developed as rural, agriculturally based enclaves and most remain as low-density, suburban communities today. The 2000 Census shows the current population of the MPO area is 368,536. In the past ten years due to a variety of factors, the Provo/Orem area has experienced significant growth with increasing densities. Both Brigham Young University, the largest private university in the nation, with an enrollment of 32,771 (2001) and Utah Valley State Collage with a full-time equivalent enrollment of 16,261 (Fall 2002) have been a magnet for rental housing and higher density development. It is a common sight in Provo to see single-family residences demolished and multiple family units constructed in their place. Orem is beginning to see similar increases in densities, but for the most part, the county land use is sprawling and automobile dependent.

The Utah Valley Long Range Transportation Plan was evaluated to determine its community and natural environments impacts and how well it will meet the transportation needs of the region in the year 2030. The plan was also analyzed to determine its conformity with state air quality plans and federal environmental regulations. The emphasis of this evaluation is to identify issues that could hinder the implementation of recommended projects or issues that will need to be addressed further in the preliminary engineering phase of any project's development.

Highway improvements recommended in the Long Range Plan will have both positive and negative impacts to the social and physical environment of the region. For example, highway and transit improvements will reduce congestion, increase accessibility, result in fewer accidents, and improve air quality; however the construction or upgrading of highways may result in increased noise, relocation of residential or commercial properties, and the destruction of wetlands. The Long Range Plan attempts to maximize the positive benefits while minimizing the negative impacts of all projects.

Highway improvement projects identified in the Long Range Plan can be socially beneficial by reducing congestion in the short term and providing new or improved land access. However, if not properly planned, projects can also have adverse social effects. Potential negative social effects include increased noise, neighborhood disruption, residential and commercial relocation, reduced access for pedestrian and bicycle commuters, reduced access for police and fire protection, and public safety.

AGENCY COORDINATION

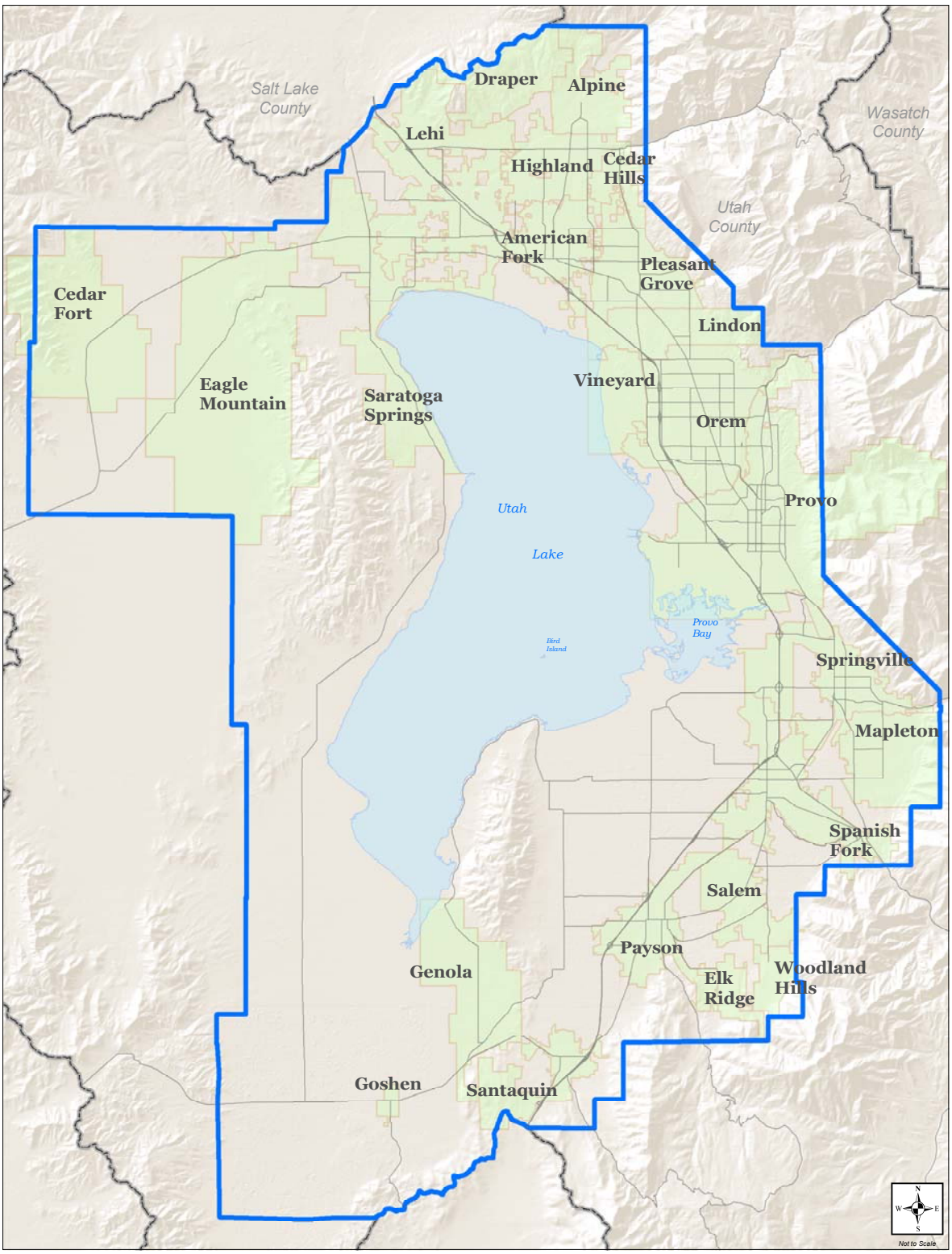
The Community and Environmental Impacts Section summarizes Mountainland's evaluation of the social, economic, and environmental impacts of the Long Range Plan. This effort was coordinated with many state and federal agencies, including but not limited to:

- Utah Division of Wildlife Resources
- Utah County's Geographic Information System
- Utah State University's Extension Service
- Utah Division of Wild Life Resources
- Natural Resource Conservation Service
- Wasatch Front Regional Council
- Utah Department of Environmental Quality
- Utah State Engineers Officer
- Utah Division of State History
- Utah Geologic Survey
- Environmental Protection Agency
- Utah Division of Water Quality
- Utah Division of Air Quality

Additional contacts will be made with these agencies while the plan is in the public review and comment period and as the plan is updated in the future.

Projects that could have major impacts were identified so that project sponsors can address potential impacts as they develop their plans.

METROPOLITAN PLANNING AREA



ENVIRONMENTAL JUSTICE AND THE LONG RANGE TRANSPORTATION PROJECTS

A 1994 Presidential Executive Order directed every Federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on "minority and low-income populations." The DOT's environmental justice initiatives accomplish this goal by involving the potentially affected public in developing transportation projects that fit harmoniously within their communities without sacrificing safety or mobility.

WHAT IS ENVIRONMENTAL JUSTICE?

There are four fundamental environmental justice principles:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.
4. To certify compliance with Title VI and address environmental justice, MPOs need to:
    a. Enhance their analytical capabilities to ensure that the long-range transportation plan and the transportation improvement program (TIP) comply with Title VI.
    b. Identify residential, employment, and transportation patterns of low-income and minority populations so that their needs can be identified and addressed, and the benefits and burdens of transportation investments can be fairly distributed.
    c. Evaluate and - where necessary - improve their public involvement processes to eliminate participation barriers and engage minority and low-income populations in transportation decision-making.

Over 1,700 names of individuals who have expressed an interest or participated in transportation planning comprise the Mountainland mailing list. This list includes known minority groups, businesses, neighborhood groups, environmental groups, and local / state government officials and representatives. Post cards in English or Spanish are mailed to all on the mailing list inviting them open houses or public meetings. News releases and flyers announcing open houses and public hearings are also written in English and Spanish. A staff member provides Spanish translation at open houses and public meetings. Formal public hearings are held prior to final approval for the Long Range Plan, Air Quality Conformity Analysis, and selection of a locally preferred alternative for any transportation corridor that is regionally significant.

An annual Transportation and Community Planning Open House is held at the Orem Senior Center. Mountainland staff, UDOT, UTA, UDAQ, and the transportation and planning representatives for the communities in Utah County all participate. They display their current and future plans including the Long Range Transportation Plan.

MINORITY, LOW INCOME, DISABLED AND ELDERLY POPULATIONS

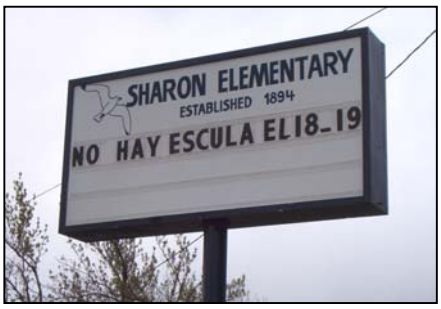
Roadway project impacts may have significant effects on minority, low income, elderly population, and disabled people. For this reason, proposed projects in the Long Range Plan were evaluated for their potential cumulative impacts upon these population groups. These populations were mapped by greater

than or less than the region average by census block group. The populations were then overlaid with a map illustrating the Long Range Transportation projects and the models above or below region average travel time within the census block group by each horizon year: 2010, 2020, and 2030.

Consideration was given to projects identified with potentially substantial noise, relocation, or neighborhood disruption impacts.

There are no tables for the environmental justice factors, as all of those analyzed were evenly distributed throughout the MPO area. This means that no group will receive the benefits or harms of the proposed Transportation services disproportionately. An even distribution of minority, aging, low income, and disabled populations is unusual in urban America and may distinguish this MPO area community impact analysis results. These populations may appear to be concentrated in the more rural area of the MPO; however that is attributed to the large geographic size of the rural census blocks/TAZ.

MINORITY GROUPS



Elementary Latino Population, Orem

The MPO area includes minority groups and persons identifying themselves as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, and Hispanic or Latino, in the 2000 census category of Race alone or in combination with one or more other races or as Hispanic and Latino. Utah County's minority population of 41,965 is approximately 11.5% of the total population. The minority population in Utah County is dispersed throughout the county with no significant concentrations. Due to this distribution the effects of roadway projects on minority populations does not appear to be significantly greater than the projected impacts on the area's population in general.

The Minority Population Map illustrates the minority populations by census block groups that have greater than the region-wide average of 11.5% minority population. The highest two census block groups by percentage for minority were located in Orem (TAZ #1214) and Provo (TAZ #1090). An off model test for each location was conducted with the program Viper in isochrome mode with 5 minute multi-color elapsed time value from each origin, going north to Draper and south to Santaquin to see how the Long Range Plan projects preformed for the minority population over the 30 year planning period. The two locations will experience drive times to Draper with 10 minute longer travel times in 2020 than in 2003 and about the same travel times in 2030 as 2003. Travel time to Santaquin will be longer in 2030 by 15 minutes than in 2003. Because of the even distribution of the minority population throughout the MPO no significant difference should exist between the minority population's travel time and the population as a whole.

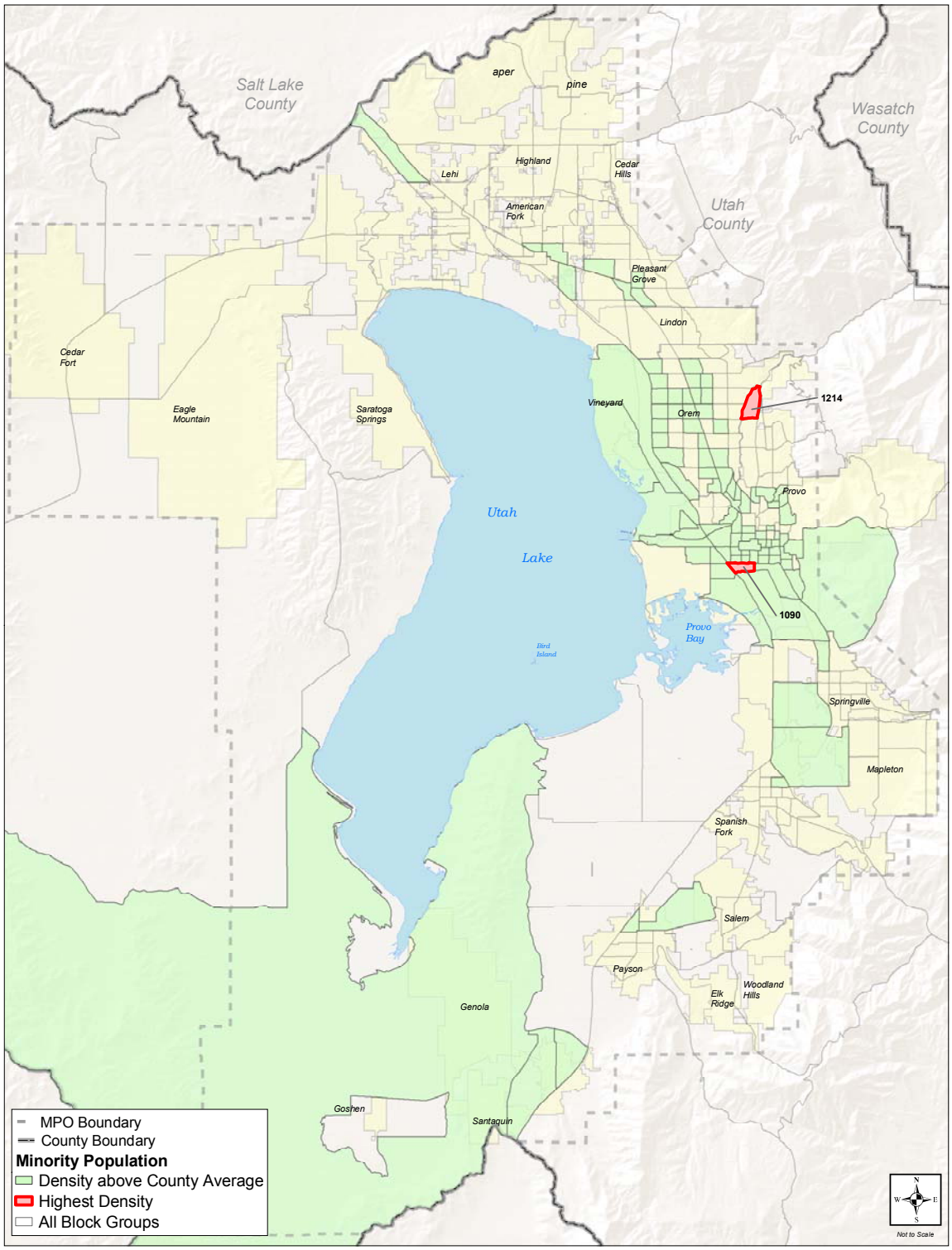
LOW-INCOME GROUPS

Low-Income residents with a 4 person household annual income of less than $17,050 in the 2000 Census were used as an impact indicator as specified by the U.S. Department of Health and Human Services 2000 poverty guidelines. 12% or 43,270 of all individuals are reported at or below the poverty thresholds. Low income populations appear to be distributed throughout the MPO. Because of this north to south east to west distribution the effect of the Long Range Plan projects does not appear to be significantly greater on the low-income populations than the projected impacts on the area's population in general.

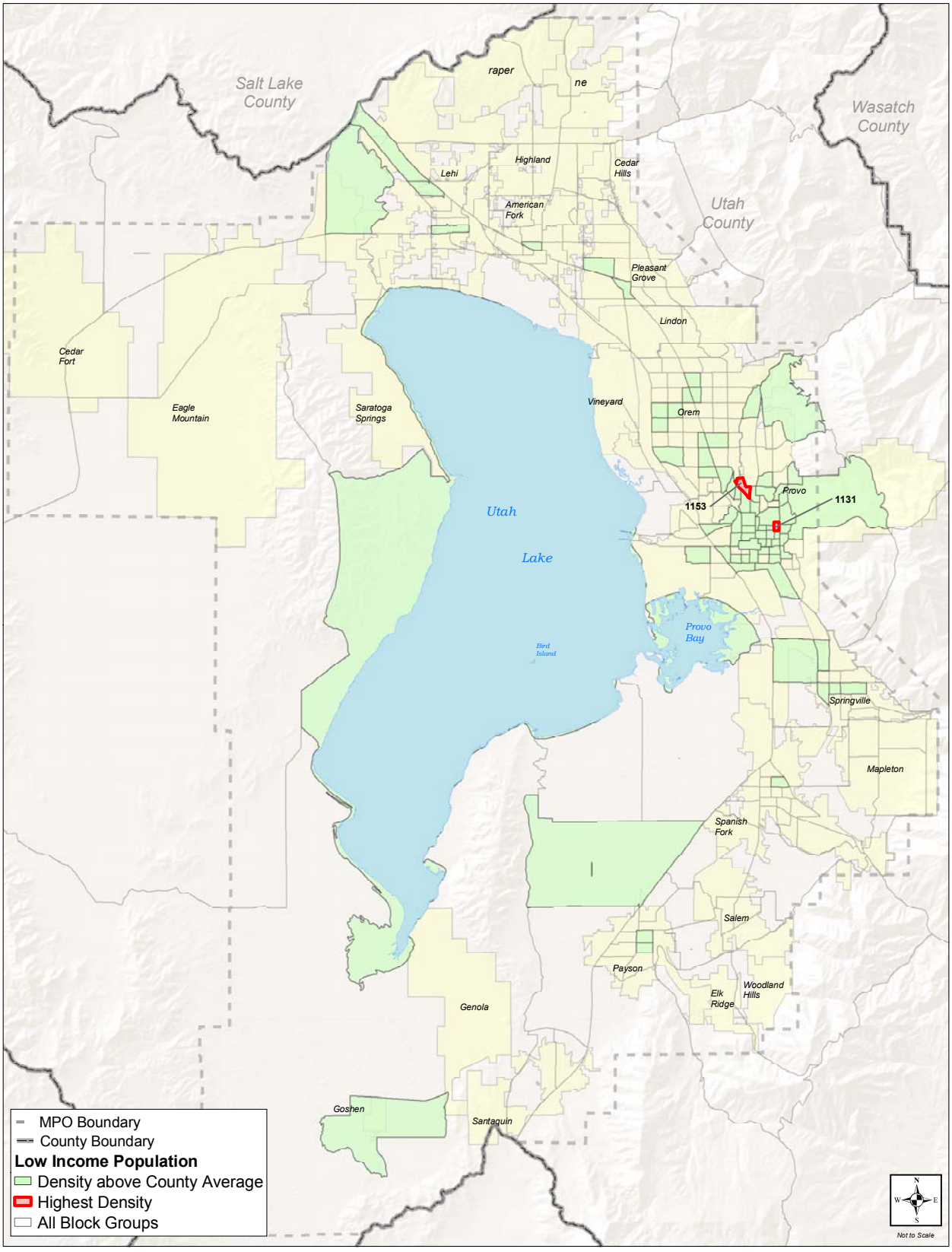
The Low-Income Group Map illustrates the Low-Income Populations by census block groups that have greater than the MPO average of 12% Low-Income population. The highest two census block groups by percentage for low-income groups were both located in Provo City (TAZ #1153 and #1131). An off model test for each location was conducted with the program Viper in isochrome mode with 5 minute multi-color elapsed time value from each origin, going north to Draper and south to Santaquin to see how the Long Range Plan projects preformed for the Low-Income Populations over the 30 year planning period. The two locations will experience drive times to Draper with 10 minute longer travel times in 2020 than in 2003

and about the same travel times in 2030 as 2003. Travel time to Santaquin will be longer in 2030 by 15 minutes than in 2003. Because of the even distribution of the Low-Income Populations throughout the MPO no significant difference should exist between the Low-Income Populations' travel time and the population as a whole.

MINORITY POPULATION MAP



LOW-INCOME GROUP MAP



PEOPLE WITH DISABILITIES

People with disabilities are described in the 2000 Census data as non-institutionalized resident's with mobility limitations, age 5 years and older. Based on 2000 Census information, 38,248 people, or 11.7% of the total MPO area's population, were considered disabled with various kinds of limitations. The disabled population appears to be evenly distributed throughout the MPO. The long Range Plan projects impacts and benefits do not appear to be significantly greater upon the disabled population than that on the area's population in general.


Disabled skier at Wasatch resort

The People with Disabilities Map illustrates the disabled populations by census block groups that have greater than the 11.7% average of the MPO's disabled population. The highest two census block groups by percentage for disabled populations were located in American Fork (TAZ #1286) and Provo (TAZ #1105). An off model test for each location was conducted with the program Viper in isochrome mode with 5 minute multi-color elapsed time value from each origin, going north to Draper and south to Santaquin to see how the Long Range Plan projects preformed for the disabled populations over the 30 year planning period. The two locations respectively will experience drive times to Draper with 2 and 12 minute longer travel times in 2020 than in 2003 and about the same travel times in 2030 as 2003. Travel time to Santaquin will be longer in 2030 by 15 and 12 minutes than in 2003. Because of the even distribution of the disabled populations throughout the MPO no significant difference should exist between the disabled populations' travel time and the population as a whole.

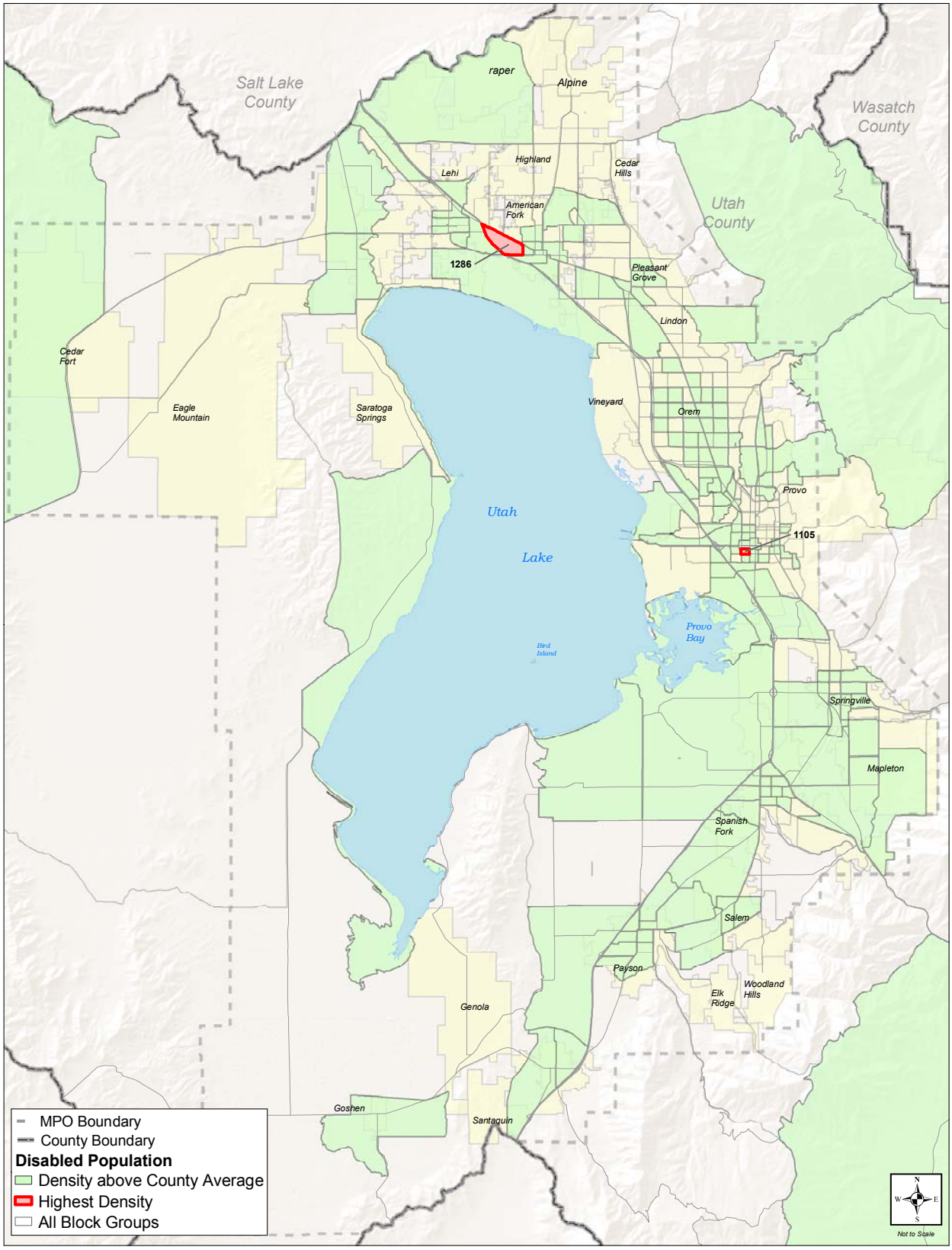
PEOPLE OVER 65

People described as elderly in the 2000 Census data are 65 years and greater. They represent 6.4% of the population or 23,503 in Utah County. Census block groups/TAZ Zones were analyzed to see which ones had a greater than average concentration of persons over 65. The blocks were then layered over the Long Range Plan projects. The elderly population appears to be evenly distributed throughout the MPO. The Long Range Plan project impacts do not appear to be disproportionate on the elderly population.

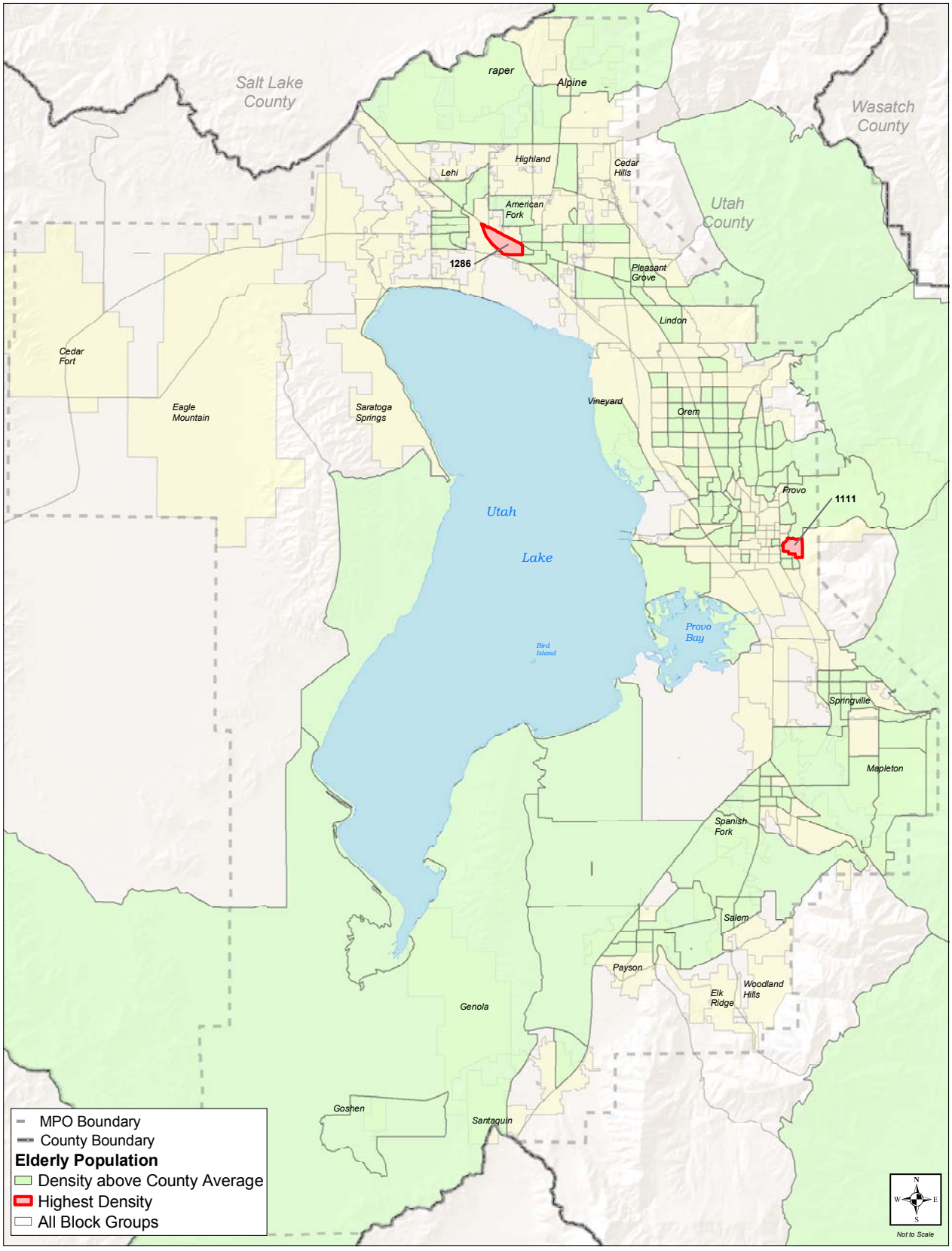

American Fork Senior Center

The People Over 65 Map illustrates the elderly populations by census block groups that have greater than the MPO average of 6.4% elderly population. The highest two census block groups by percentage for people over 65 were located in American Fork (TAZ #1286) and Provo (TAZ #1111). An off model test for each location was conducted with the program Viper in isochrome mode with 5 minute multi-color elapsed time value from each origin, going north to Draper and south to Santaquin to see how the Long Range Plan projects preformed for the elderly populations over the 30 year planning period. The two locations respectively will experience drive times to Draper with no longer and 12 minute longer travel times in 2020 than in 2003 and about the same travel times in 2030 as 2003. Travel time to Santaquin will both be longer in 2030 by 15 minutes than in 2003. Because of the even distribution of the elderly populations throughout the MPO no significant difference should exist between the elderly populations' travel time and the population as a whole.

PEOPLE WITH DISABILITIES MAP



PEOPLE OVER 65 MAP



Conclusions

- Transportation facilities that will create a barrier within currently functioning neighborhoods should be relocated.
- Many cities have general plans that outline neighborhoods as well as neighborhood councils, which can be helpful in designing facilities that provide access without creating social barriers.
- Design for convenient access to shopping, medical services and employment should be provided with special consideration of the elderly and disabled. For example, wide street crossings need sufficient signalization and time allotted for slower moving citizens to cross.
- Uneven burdens for transportation negative impacts or benefits should be avoided through considering spatial distribution of disadvantaged groups in relationship to transportation facilities.
- A balanced system providing equal benefits and impacts throughout the area with all modes is included in the Long Range Plan through GIS analysis. This balance should be carried forward through the implementation of the plan.

SOCIAL IMPACTS AND THE LONG RANGE TRANSPORTATION PROJECTS

LAND USE

CURRENT LAND USE

Recent development and current land use trends in the MPO area are oriented toward sprawl rather than infill and higher densities. Recently several municipalities have expanded their declarations of annexation to adjacent municipalities' declared boundaries and several communities are arbitrating boundary disputes through mediation. One motivation for expansion by the cities is increased property taxes to support ever-increasing infrastructure costs. The county has zoned the unincorporated areas for very low densities while encouraging development to take place within existing city boundaries. Most cities in the urbanized area have centered commercial land uses around the primary highway that was used when the area was first settled, US-89. Within the MPO area the highway is commonly referred to as State Street. State Street runs contiguously from Lehi to the south in Spanish Fork. This Highway acts as the "main street" to the communities of Lehi, American Fork, Pleasant Grove, Lindon, Orem, Provo, Springville, and Spanish Fork. This route parallels several rail lines offering both passenger and freight service. The communities were once like a string of pearls with very defined boundaries and dense central commercial cores. Current development along this route has decentralized commercial activities and separated residential areas. Community boundaries are now imperceptible in the central urbanized area from Lindon in the north to Springville in the south.

I-15 parallels US-89 and has large industrial tracts of land on either side. This industrial development has been very successful in attracting tenants. The industrial parks include steel manufacturing and fabrication, commodity processing, professional office parks, and large computer software development firms with support facilities.

The area to the east of I-15 is largely low-density single-family residential development with exceptions in Provo, Orem, and American Fork. These three communities have multifamily housing units with a very low vacancy rental rate (estimated at 3% in 1997).

AFFORDABLE HOUSING

The MPO's housing market has seen continuous growth and expansion for quite a number of years without the indication of a slump or serious downturn. The population of the region is expected to continue its upward climb, although not at the break-neck pace of the past decade. The current Utah County population (Census 2000) is 368,536.

Multi-Family Housing Units

Average rents estimated in Utah County for the year 2000 range from a low of $546/month in Cedar Fort to $1,137/month in Elk Ridge. Rent in Provo and Orem, where the majority of the population resides, and where most of the college students live, average $583 in Provo and $628 in Orem. Rental statistics show that nearly every community in the region exhibits average rents which are well above HUD's Fair Market Rents (FMR), or those which can be afforded by families with average incomes. The National Low Income Housing Coalition publishes annual data (1998 is the most recently available) for the Provo-Orem MSA (Utah County) which confirms that FMR is unattainable by many families for a host of factors including low per capita income, high persons per household, high area rents, etc.

Also, on the decline is the number of persons per household suggesting an overall aging of the region's population and the potential need for more elderly and assisted-care units in the not-too-distant future.

The aging population also suggests that some large family units may become available for younger families as baby boomers retire to the smaller quarters offered in condos, rentals, or small homes, although specific statistics on this housing "shift" are not readily available. There are current shortages in affordable units for both renters and homeowners and this trend is likely to continue. With two major institutions of higher learning, Utah County is projected to continue to show a strong need for both student and starter rentals and owner units for the foreseeable future.

Since the MPO is not a municipal or county government with the authority to tax or regulate public behavior, the Utah Valley MPO role in housing, given by its board, is to be that of a resource for those who can enforce and direct public dollars into needy areas and projects. Mountainland staff planners provide technical assistance on a daily basis to all of Mountainland's members, have put together a short "Housing Development Plan" which addresses some of the needs of the region as a whole, but does not supercede the work of individual jurisdictions in any way.

Another role the staff has played is that of assisting communities to meet the statutory requirements of current state housing law which requires that moderate income housing plans be adopted and updated by the larger communities in the State of Utah. The goal is to develop more affordable housing as well as to remove barriers to housing choice and opportunity as the cities and counties look more closely at their current housing situations.

FUTURE LAND USE

The future land use characteristics of the Provo / Orem Urbanized Area play a key role in determining the travel demands for the year 2030. The relationship between transportation and land development is very complex and reciprocal: on one hand land use effects travel decisions and facilities while travel decisions and facilities affect land use.

Local governments, such as counties and cities, are responsible for land use planning in Utah. As a part of this responsibility, cities and counties must prepare a general plan (often referred to as a comprehensive or master plan). The plans contain goals, objectives and policies relating to the pattern, density and type of future land use each community envisions. Most of the developable area is planned for low-density residential (2-3 homes per acre). Some higher densities are planned, but the southern part of Utah County is zoned mostly for lower densities. Industrial land uses are planned for the I-15 corridor with business parks located in American Fork, Orem, Provo, and Springville. Areas of commercial/retail land use include the State Street corridor and concentrations in Provo with each community identifying small concentrations in town centers.

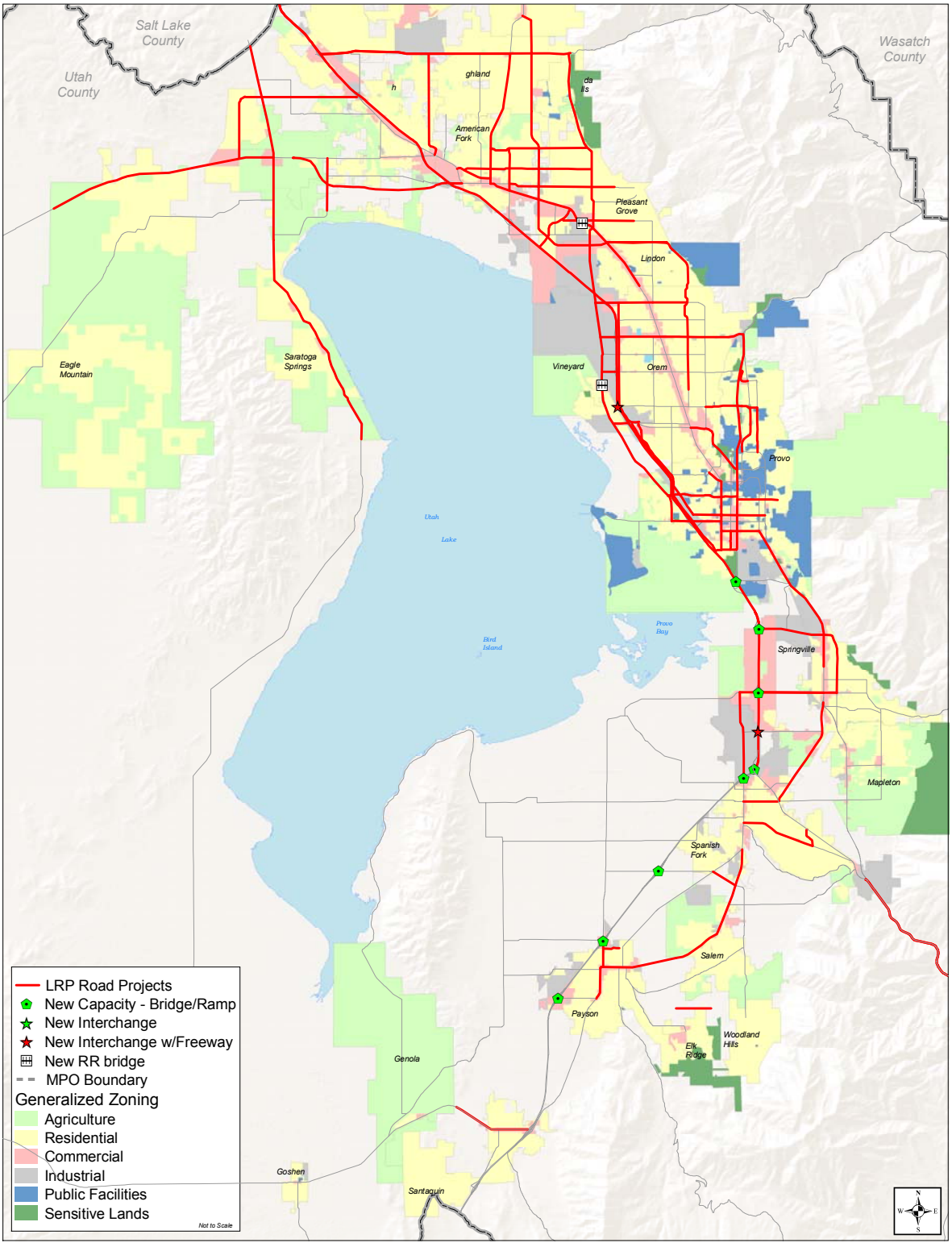
Past trends in land use have resulted in dispersed or low-density urban development patterns in Utah Valley. These patterns have not just occurred by chance, but rather by design. The public has overwhelmingly demanded single-family homes, as well as personal mobility facilitated by the private automobile. Low-density development is most conveniently served by the automobile and less effectively served by mass transit modes. This has been true for most of America and particularly for the suburban areas of Utah County.

Growing congestion makes it evident that the provision of new transportation improvements is not keeping pace with the growth and changes in transportation demand. The rapid growth of the suburbs during the past 30 or more years has created a new and very significant change in urban travel patterns. Part of that change is the increase in suburb-to-suburb travel. The trend to decentralize and disperse population and employment will increase the development of suburban commercial/industrial traffic generation in the foreseeable future. Much of this development has occurred without the supporting transportation improvements needed to serve it. This situation will place further demands on a transportation system, which cannot keep up with demand throughout the Utah Valley.

Planners and engineers have studied this relationship for many years. The current land use and transportation system seems difficult to change given current land use policy and concerns about private property rights. Effectively articulating and coordinating needed changes during the planning process

may help bring about change in this age of fiscal and environmental constraints. The calculation of costs and increased travel associated with current land use policies compared with a community's budget and emissions caps may help to bring about policy changes furthering land use and transportation integration.

GENERALIZED LAND USE MAP



Regional and local planners must carefully consider the transportation implications of their land use decisions, and transportation planners must consider the influence of transportation investments on land use patterns and urban economics. In order to avoid growing traffic congestion, it will become more and more important to connect land use and transportation plans.

Mountainland has coordinated transportation planning with local established land use plans (Nebo and Timpanogos Vision plans). These plans are adopted by local governments and integrated into our travel demand model, through their use in projecting the location of population and economic growth. The development of the Long Range Plan recommendations gave significant consideration to the location of future population and employment as they indicate future transportation demand. In developing the Long Range Plan, Mountainland has attempted to create a plan that will best support the official long-range land use and transportation policies of the local communities.

Anticipated land use development impacts are primarily associated with new arterial facilities that will provide development access to adjacent property. Existing roads that will be upgraded to arterial and primary arterial facilities will also have measurable impact on adjacent residential zoned land uses. Significant impacts are predicted to occur and are associated with the following projects.

LAND USE IMPACTS TABLE

LRP #	Land Use Impacts and Long Range Plan Projects	Real estate development & increased traffic demand will most likely occur due to new roads improved real estate access	Traffic speed & count will increase adjacent to existing residential neighborhood
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X	
HWY-1.3	Geneva Road, Provo to Pleasant Grove		X
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs	X	
HWY-1.7	Main Street, Payson		X
HWY-1.6	800 North, Orem		X
HWY-1.8	100 East, Pleasant Grove		X
HWY-1.9	Provo Center, Provo		X
HWY-1.11	State Road, Spanish Fork to Salem		X
HWY-1.12	State Street, American Fork to Lindon		X
HWY-2.1	100 East, American Fork / Alpine Highway, Highland		X
HWY-2.2	Canyon Road, Pleasant Grove to Highland		X
HWY-2.5	100 West, Payson		X
HWY-2.8	300 South/Canyon Road, Spanish Fork		X
HWY-2.9	400 North, Spanish Fork		X
HWY-2.10	400 South, Springville		X
HWY-2.12	Main Street, Springville / State Street, Provo		X
HWY-2.13	University Ave, Provo		X
HWY-3.1	3500 North, Lehi / 11000 North, Highland		X
HWY-3.2	100 North/State Road, Payson		X
HWY-3.3	300 South, Provo		X

LRP #	Land Use Impacts and Long Range Plan Projects Cont'd	Real estate development & increased traffic demand will most likely occur due to new roads improved real estate access	Traffic speed & count will increase adjacent to existing residential neighborhood
HWY-3.4	500 West, Provo		X
HWY-3.5	Main Street, Santaquin		X
HWY-3.7	SR-51, Spanish Fork/Springville		X
HWY-3.8	University Parkway, Orem		X
ROAD-1.1	700 North, Lindon / 2000 West, Pleasant Grove	X	
ROAD-1.2	1600 North, Orem		X
ROAD-1.3	Pleasant Grove Blvd, Pleasant Grove	X	
ROAD-1.6	2000 East, Spanish Fork	X	
ROAD-1.7	Woodland Hills Drive, Utah County	X	
ROAD-2.2	1100 East, American Fork / 4800 West, Highland		X
ROAD-2.3	Battle Creek Drive, Pleasant Grove		X
ROAD-2.7	800 North, Lindon / 1000 South Pleasant Grove	X	
ROAD-2.8	800 South, Orem / 3700 North, Provo		X
ROAD-2.10	1600 North, Orem		X
ROAD-2.12	920 South, Provo		X
ROAD-3.3	700 North, American Fork / 2600 North, Pleasant Grove		X
ROAD-3.4	Main Street, American Fork / 1100 North, Pleasant Grove		X
ROAD-3.5	Battle Creek Drive, Pleasant Grove		X
ROAD-3.6	4800 West, Highland / Canyon Crest Road, Alpine		X
ROAD-3.10	1200 East, Lindon / 400 East, Orem		X
ROAD-3.12	600/700 North, Payson		X
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove	X	
ROAD-3.14	200 North, Provo	X	
ROAD-3.17	Provo Canyon Road, Provo		X

All highway improvements are consistent with local government traffic plans and act as an integral part of their individual long range transportation master plans.

Conclusions

- Dispersed development will result in VMT growth exceeding population growth. Utah County's VMT has increased by 21% in the past decade. The Envision Utah analysis completed by the state with Mountainland's technical support illustrated that this growth could be curbed by changing the current trends in land use.

- The growth in VMT results in increased infrastructure costs, both maintenance and new facilities.

ECONOMIC IMPACTS

Two interstate highway interchanges in the Utah Valley have undergone major reconstruction (South University Avenue Interchange and the Parkway Interchange). One additional new interchange (the Pleasant Grove Interchange) has been constructed and opened in the fall of 2002. With these improvements and the additional access they provide, economic activity is likely to be stimulated. Transportation improvements on other major highways are also promoting economic growth by providing more convenient access and reducing travel delays and driving time. In addition, upgrading to new highway standards and improving design geometrics is reducing accidents and minimizing exposure to liability.

1. Fuel Consumption: Increases in the number of vehicles on the road in Utah County will increase fuel usage. Assuming greater vehicle fuel efficiencies in the future, the amount of fuel consumed daily in 1996 will increase significantly by 2030.

2. Operating Costs: Operating costs of a vehicle are a function of vehicle miles traveled. They include fuel and oil costs, maintenance, vehicle depreciation, insurance, and taxes. As the Traffic Related Economic Factors table shows, total vehicle operating costs will increase by 2030 due to increases in the total travel. However, some savings in operating costs per vehicle are likely to occur through reduced congestion resulting from capacity improvements suggested in the Long Range Plan.

3. Energy Impacts: One of the goals of the Long Range Plan is to minimize energy consumption by reducing existing congestion. This will be accomplished by controlling average speeds with ITS and speed enforcement, and by reducing overall VMT by providing multimodal transportation elements.

TRAFFIC RELATED ECONOMIC FACTORS *

	1996 System	2010 Long Range Transportation Plan	2020 Long Range Transportation Plan	2030 Long Range Transportation Plan
Total VMT	6,733,700	10,200,000	13,000,000	17,000,000
Vehicle Operating Cost ($)	$2,255,870	4,540,000	$6,630,000	$9,900,000
@ per mile	31¢	44.5¢	51¢	58¢
Gallons of Gasoline	323,422	392,000	340,000	310,000
@ miles per gallon	22.5	26.0	38.5	55.0
* Average Weekday Statistics				

The State Division of Energy has identified several programs for energy conservation in transportation. The programs include: rideshare, driver training, alternative fuels, bus and truck maintenance performance savings, and right-turn-on-red. State energy conservation policy related to transportation is directed through the State of Utah Division of Energy. Several elements are required to be investigated by the Division of Energy under the Energy Conservation Program, one of which is transportation. An outline of the program specific objectives follows:

- Rideshare (Car pool / Van pool)
  - Increase the rideshare base
  - Computer matching of participants
  - Employer ride share contracts
  - Rideshare media promotion
- Driver Training
  - Increased understanding of vehicle operation and maintenance
- Bus and Truck Maintenance Performance Savings
  - Increased knowledge of vehicle best possible operation and maintenance procedures
- Right-Turn-On-Red
  - Increased awareness of availability and use

The Long Range Plan supports the state's goals for energy use reduction and recommends that many of the programs included in the state's plan be continued into the future.

SCHOOL SAFETY IMPACTS

Utah State Law requires Utah Schools districts to provide school bus transportation for students K-7 that live 1½ miles and greater from school and for 8-12 grade students that live 2 plus miles from school. Highway project impacts to school safety vary according to the nature of the new roadway or roadway change, the type of school involved and the traffic exposure student pedestrians encounter. This analysis is limited to identifying projects with major impacts on school safety. This will include projects that widen an existing road or build a new facility within a quarter mile of a school within an existing residential neighborhood.

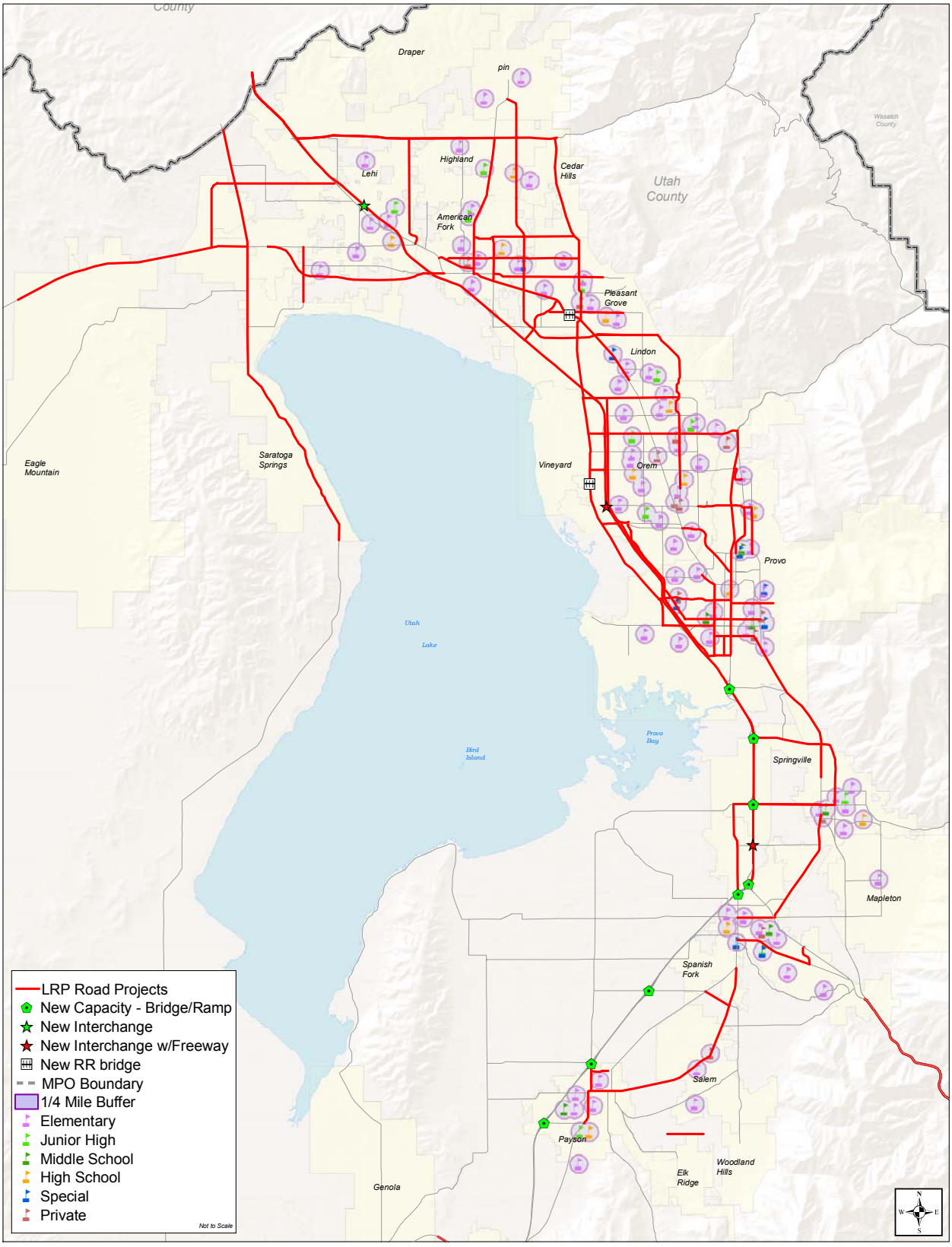
Payson City Crossing Guard

Major facilities carrying significant traffic volumes at relatively high speeds could potentially affect school safety. Specific project impacts and mitigation measures should be identified in the environmental phase of the project's development. Some of the potential mitigation to be identified during the specific project impact assessment phase may include the provision of pedestrian overpasses and/or new busing areas.

SCHOOL IMPACTS WITHIN A 1/4 MILE

LRP #	School Impacts and Long Range Plan Projects	School Within ¼ mile radius
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X
HWY-1.3	Geneva Road, Provo to Pleasant Grove	X
HWY-1.5	3500 North, Lehi / 11000 North, Highland	X
HWY-1.6	800 North, Orem	X
HWY-1.7	Main Street, Payson	X
HWY-1.8	100 East, Pleasant Grove	X
HWY-1.11	State Road, Spanish Fork to Salem	X
HWY-1.12	State Street, American Fork to Lindon	X
HWY-1.13	University Parkway, Orem to Provo	X
HWY-2.1	100 East, American Fork / Alpine Highway, Highland	X
HWY-2.5	100 West, Payson	X
HWY-2.8	300 South/Canyon Road, Spanish Fork	X
HWY-2.9	400 North, Spanish Fork	X
HWY-2.10	400 South, Springville	X
HWY-2.12	Main Street, Springville / State Street, Provo	X
HWY-2.13	University Ave, Provo	X
HWY-3.1	3500 North, Lehi / 11000 North, Highland	X
HWY-3.3	300 South, Provo	X
HWY-3.4	500 West, Provo	X
HWY-3.7	SR-51, Spanish Fork to Springville	X
HWY-3.5	Main Street, Santaquin	X
HWY-3.6	400 South, Springville	X
ROAD-1.4	4800 North/Foothill Drive, Provo	X
ROAD-2.1	Pacific Drive/100 North, American Fork	X
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	X
ROAD-2.4	Columbia Lane, Provo	X
ROAD-2.6	Independence Ave, Provo	X
ROAD-2.8	800 South, Orem / 3700 North, Provo	X
ROAD-2.10	1600 North, Orem	X
ROAD-2.11	800/820 North, Provo	X

SCHOOL IMPACTS MAP



LRP #	School Impacts and Long Range Plan Projects Cont'd	School Within ¼ mile radius
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove	X
ROAD-3.2	500 East, American Fork	X
ROAD-3.4	Main Street/50 South, American Fork / 1100 North, Pleasant Grove	X
ROAD-3.5	Battle Creek Drive, Pleasant Grove	X
ROAD-3.10	1200 East, Lindon / 400 East, Orem	X
ROAD-3.12	600/700 North, Payson	X
ROAD-3.14	500 North, Provo	X
ROAD-3.15	500 West, Provo	X
ROAD-3.17	Provo Canyon Road, Provo	X
ROAD-3.19	400 East/1400 North, Springville	X
ROAD-3.20	400 South, Springville	X
ROAD-3.21	Timpview Drive, Provo	X

Conclusion

- Signage near school areas should be consistent with the new AASHTO guidelines.
- Pedestrian and bicycle facilities are being planned linking schools with residential areas helping provide safe trips to school.
- Mountainland and city staffs work with school district (Safe Trip to School Program).

RELOCATION IMPACTS

Neighborhood disruption and relocation impacts vary with each transportation project proposed. Relocation impacts are determined if insufficient right-of-way considers exist. Neighborhood disruption occurs when homes, businesses, or community institutions are eliminated from the neighborhood or when the roadway becomes a barrier to neighborhood interaction.

The Relocation and Neighborhood Impacts Table, lists projects that were determined to have the greatest potential for relocations. This includes roadway upgrade projects that require more than 30 feet of additional right-of-way and pass through already developed residential or commercial areas.

Shifting highway alignment during project design may mitigate relocations. Neighborhood disruptions may also be minimized by providing pedestrian and bike crossing facilities, depressing the roadway to limit its visual intrusion into the community, and/or helping impacted neighborhood resources to re establish themselves within the same neighborhood.

RELOCATION IMPACTS TABLE

LRP #	Relocation Impacts and Long Range Plan Projects	Relocation Residential or Commercial	Neighborhood Disruption
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X	
HWY-1.6	800 North, Orem	X	X
HWY-1.7	Main Street, Payson	X	X
HWY-1.8	100 East, Pleasant Grove	X	X
HWY-2.1	100 East American Fork / Alpine Highway, Highland	X	X
HWY-3.3	300 South, Provo	X	X
ROAD-1.2	1600 North, Orem	X	X
ROAD-1.5	Sandhill Road, Orem	X	X
ROAD-2.2	1100 East American Fork / 4800 West Highland	X	X
ROAD-2.3	Battle Creek Drive, Pleasant Grove	X	
ROAD-2.7	800 North, Lindon / 1000 South, Pleasant Grove	X	

LRP #	Relocation Impacts and Long Range Plan Projects Cont'd	Relocation Residential or Commercial	Neighborhood Disruption
ROAD-2.10	1600 North, Orem	X	
ROAD-2.12	920 South, Provo	X	
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove		X
ROAD-3.2	500 East, American Fork		X
ROAD-3.9	800 North, Lindon / 1000 South, Pleasant Grove	X	
ROAD-3.10	1200 East, Lindon / 400 East, Orem	X	
ROAD-3.12	600/700 North, Payson		X
ROAD-3.14	200 North, Provo	X	X
ROAD-3.19	400 East/1400 North, Springville		X

Conclusion

- Provide sufficient funding the planning, design, and implementations phases of these projects to accommodate relocations of households and businesses.
- If low-income housing is impacted mitigation measures should be planned to replace the housing in a nearby location.
- If the location of the facility divides an established neighborhood a more preferable alignment/ right-of-way should be sought.
- Pedestrian access, greenways, or trails can be used to connect neighborhoods divided by a facility. Funding of the highway or transit project should include such measures.

NOISE IMPACTS

Noise impacts vary based upon the characteristics of traffic, roadway, and adjacent land uses. The relevant traffic characteristics are traffic volume, speed, and vehicle mix. The roadway characteristics effecting noise include grades and the presence or absence of noise barriers. Also important are the noise sensitivity of adjacent land uses, the distance between the roadway and the land use, and the design and construction of affected buildings.

Noise Barrier with Landscaping

Most projects will have relatively minor or no impact on existing developed areas. Listed below are the projects having the greatest potential for noise impacts upon adjacent communities. The projects are on the list because they pass through residential zoned areas, near schools, day care or care facilities, hospitals and are high speed, high volume facilities - freeways and arterials.

Project noise impact assessments and mitigation measures will be determined at a later date during project design. By shifting the highway alignment away from noise sensitive land uses, depressing the roadway, or installing noise barriers between the highway and the sensitive areas, adverse noise effects may be reduced.

NOISE IMPACTS TABLE

LRP #	Noise Impacts and Long Range Plan Projects	Zoned Residential Area Impact	Schools/Day Care/Care Facilities Impacts	Limited Access Facility (Candidate for noise barrier)
HWY-1.2	Main Street, American Fort / 1000 South, Lehi	X		
HWY-1.3	Geneva Road, Provo to Pleasant Grove	X		

LRP #	Noise Impacts and Long Range Plan Projects Cont'd	Zoned Residential Area Impact	Schools/Day Care/Care Facilities Impacts	Limited Access Facility (Candidate for noise barrier)
HWY-1.4	2100 North Lehi / 11600 West Saratoga Springs	X		
HWY-1.6	800 North, Orem	X	2	
HWY-1.7	Main Street, Payson	X		
HWY-1.8	100 East, Pleasant Grove	X		
HWY-1.9	Provo Center, Provo	X		
HWY-1.10	Redwood Road, Lehi to Saratoga Springs	X		
HWY-1.11	State Road, Spanish Fork to Salem	X	1	
HWY-1.12	State Street, American Fork to Lindon	X		
HWY-1.13	University Parkway, Orem to Provo	X		
HWY-2.1	100 East, American Fork / Alpine Highway, Highland	X	1	
HWY-2.2	Canyon Road, Pleasant Grove to Highland	X		
HWY-2.3	Cedar Fort Highway (SR-73)	X		
HWY-2.5	100 West, Payson	X		
HWY-2.7	Redwood Road, Saratoga Springs	X		
HWY-2.8	300 South/Canyon Road, Spanish Fork	X	1	
HWY-2.9	400 North, Spanish Fork	X	1	
HWY-2.10	400 South, Springville	X		
HWY-2.12	Main Street, Springville / State Street, Provo	X		
HWY-2.13	University Ave, Provo	X	1	X
HWY-3.1	3500 North, Lehi / 11000 North, Highland	X		
HWY-3.2	100 North/State Road, Payson	X		
HWY-3.5	Main Street, Santaquin	X		
HWY-3.3	300 South, Provo	X		
HWY-3.4	500 West, Provo	X	1	
HWY-3.7	SR-51, Spanish Fork to Springville	X		
HWY-3.8	University Parkway, Orem	X		
ROAD-1.1	700 North, Lindon / 2000 West, Pleasant Grove	X		
ROAD-1.2	1600 North, Orem	X		
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	X		
ROAD-2.10	1600 North, Orem	X		
ROAD-3.6	4800 West, Highland / Canyon Crest Road, Alpine	X	1	
ROAD-3.8	2300 West, Lehi	X		
ROAD-3.12	600/700 North, Payson	X		
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove	X		
ROAD-3.17	Provo Canyon Road, Provo	X		
FWY-1.1	I-15 Freeway - Lehi	X		X
FWY-2.1	I-15 Freeway - Lehi to American Fork	X		X
FWY-3.2	I-15 Freeway - American Fork to Orem	X		X
FWY-3.3	I-15 Freeway - Orem to Provo	X		X

Limited access highways most frequently and reasonably incorporate noise barriers. Noise mitigation is less effective or not effective for other projects, because access reduces the effectiveness of mitigation. UDOT's noise mitigation policy states that: mitigation will not be incorporated into sections of projects

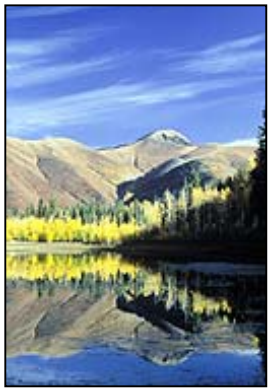
where local government has not already approved development at the time highway facilities construction begins. Therefore, the affected city or county should require new developments to give proper consideration to the noise effects of the highway facilities as development occurs. These considerations could include proper setback distances from the noise source, walls, or berms between the noise source and receptor.

Conclusions

- Control access facilities should be investigated for noise impacts alleviation.
- Mitigation for potential noise should be included in the project cost estimates and design.
- Noise sensitive land uses should be permitted only at suitable distances from these facilities.
- Where possible, landscaping, and compatible land uses could eliminate or reduce noise and maintain quality of life near transportation facilities.

VISUAL IMPACTS

Visual impacts can occur when a transportation project is located in a particular scenic area, when a project is located on a steep grade, when cut and fill practices are employed or when a project is located in an important view shed area. To identify projects that could impact visual quality, Mountainland staff compared the location of the long range projects with the location of Utah designated Scenic Byway or Back ways, scenic view shed/canyon environments, and slopes greater than 10% and by comparing project improvements with scenic view sheds. Potentially impacted projects are listed on the Visual Impacts Table.



Nebo Loop National Scenic Byway

Specialized design and construction practices can often reduce visual impacts of improved projects. These techniques include texturing hard surfaces, tree planting, landscaping, sculpting earth work to look natural, and using native materials or colors from the surrounding landscape. Specific impact assessment should be determined at a project's initial scoping and environmental review.

VISUAL IMPACTS

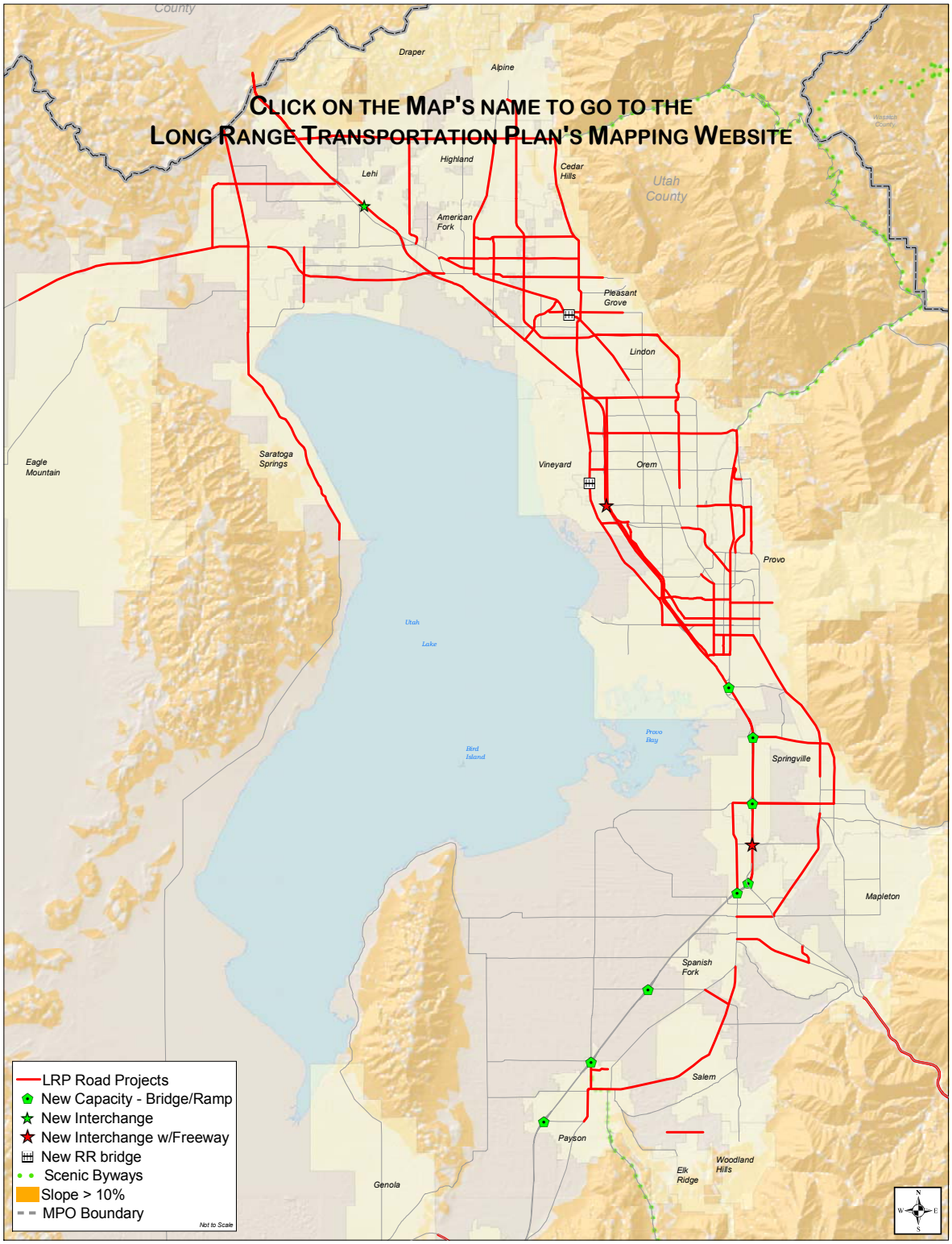
LRP #	Visual Impacts and Long Range Plan Projects	Scenic View Shed/Canyon Environment	Slopes 10% and Greater	Utah Designated Scenic Byway or Back way
HWY-1.5	3500 North, Lehi / 11000 North, Highland	X	X	X
HWY-1.7	Main Street, Payson			X
HWY-1.14	US-6-Spanish Fork Canyon	X	X	
HWY-2.2	Canyon Road, Pleasant Grove to Highland		X	
HWY-2.12	Main Street, Springville / State Street, Provo		X	
HWY-2.14	US-6-Spanish Fork Canyon	X	X	
HWY-3.2	100 North/State Road, Payson			X
ROAD-3.10	1200 East, Lindon / 400 East, Orem		X	

Conclusion

- Mitigation of visual impacts should be included in the project costs for design and construction.
- Public input and comments from citizen groups should be considered in the design of projects in visually sensitive areas.
- Enhancement funds can be used in conjunction with construction funds in these areas to help fund landscaping, special signage, kiosks etc.

- Art may be used to improve the visual quality of transportation projects; however it is seldom used in our area. Citizen groups could be enlisted to recommend artistic designs appropriate for the projects.

VISUAL IMPACTS MAP



CULTURAL AND HISTORIC RESOURCE IMPACTS

Transit and roadway projects can negatively impact cultural resources by creating noise, vibration, the need to relocate, vandalism, physical impacts, and others. Positive impacts may also result by providing improved access to important community cultural resources.

Historic Mansion, Provo City

For this analysis the State Historic Preservation Office felt that considering individual prehistoric, or known archaeological sites, would not be appropriate without an in-depth study of each of the project areas during pre-construction. However several highway projects are identified as being in areas that may lead to conflict with sites listed on the National and State Historic Registers as provided by the Utah Department of History.

HISTORIC SITE IMPACTS TABLE

LRP #	Historic Site Impacts and Long Range Plan Projects	Number of Possible Historic Sites Impacted
HWY-1.3	Geneva Road, Provo to Pleasant Grove	**6**
HWY-1.6	800 North, Orem	**5**
HWY-1.7	Main Street, Payson	**3**
HWY-1.8	100 East, Pleasant Grove	**22**
HWY-1.9	Provo Center, Provo	**1**
HWY-1.11	State Road, Spanish Fork to Salem	**1**
HWY-1.12	State Street, American Fork to Lindon	**11**
HWY-2.1	100 East American Fork / Alpine Highway Highland	**11**
HWY-2.8	300 South/Canyon Road, Spanish Fork	**5**
HWY-2.10	400 South, Springville	**17**
HWY-2.12	Main Street, Springville / State Street, Provo	**1**
HWY-2.13	University Ave/US-189, Provo	**36**
HWY-3.3	300 South, Provo	**58**
HWY-3.4	500 West, Provo	**52**
HWY-3.7	SR-51, Spanish Fork to Springville	**3**
ROAD-1.2	1600 North, Orem	**7**
ROAD-1.5	Sandhill Road, Orem	**4**
ROAD-2.1	Pacific Drive/100 North, American Fork	**12**
ROAD-2.3	Battle Creek Drive, Pleasant Grove	**20**
ROAD-2.5	Freedom Blvd, Provo	**13**
ROAD-2.8	800 South, Orem / 3700 North, Provo	**20**
ROAD-2.9	1200 West, Orem	**5**
ROAD-2.10	1600 North, Orem	**11**
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove	**15**

LRP #	Historic Site Impacts and Long Range Plan Projects Cont'd	Number of Possible Historic Sites Impacted
ROAD-3.2	500 East, American Fork	**2**
ROAD-3.3	700 North, American Fork / 2600 North, Pleasant Grove	**5**
ROAD-3.4	Main Street/50 South, American Fork / 1100 North, Pleasant Grove	**13**
ROAD-3.5	Battle Creek Drive, Pleasant Grove	**13**
ROAD-3.7	1200 East, Lehi	**4**
ROAD-3.8	2300 West, Lehi	**1**
ROAD-3.9	800 North, Lindon / 1000 South, Pleasant Grove	**3**
ROAD-3.10	1200 East, Lindon / 400 East, Orem	**10**
ROAD-3.14	200 North, Provo	**38**
ROAD-3.15	500 West, Provo	**9**
ROAD-3.17	Provo Canyon Road, Provo	**3**
ROAD-3.19	400 East/1400 North, Springville	**37**
ROAD-3.20	400 South, Springville	**21**
FWY-3.2	I-15 Freeway - American Fork to Orem	**2**

Impacts to all cultural resources will be identified and mitigation measures determined during the environmental phase of project development. If unknown cultural resources are encountered during the project development/construction phase, appropriate investigation should take place. Reasonable efforts should be made to provide access and information to the site during construction. Such mitigation might, for example, include the placement of historical information markers, in addition to providing the standard documentation.

Conclusion

- Appropriate access should be provided to Cultural and Historic sites.
- When possible Cultural and Historic sites should be preserved. The preferred alignment and right-of-way should be located a suitable distance from the site.
- While good vehicular access is needed to cultural and historic sites. Extremely large vehicular facilities can isolate cultural and historic sites from the community, especially from pedestrian and cyclists. Alternative routes should be provided along with any vehicular improvements to ensure complete access.

TRAIL FACILITIES AND SECTION 4(F) IMPACTS

Since the enactment of Section 4(f) in 1966, court interpretations and many years of project-by-project applications, FHWA has developed numerous policy positions on various aspects of the Section 4(f) requirements. Section 4(f) applies to *all* historic sites, but only to publicly owned parks, recreational areas, and wildlife and waterfowl refuges.

All existing and proposed trail facilities are or will be publicly owned; 4(f) facilities refer to publicly owned or public interest properties. Because trails make important non-motorized connections between origins and destinations, it is essential that they exist as contiguous facilities. Highway and other transportation projects can adversely affect trails by interrupting existing or planned routes. Each of these projects should therefore provide for the continuity of both existing and planned trails with the incorporation of underpasses/overpasses or other appropriate connections. The following table illustrates planned transportation projects in relationship to these publicly own or public interest properties.

College Connector Trail, Provo

In addition, the mountains east of the MPO area provide recreation and open space for the people of Utah County. The Uinta National Forest is a nationally recognized winter and summer recreation area for skiers and hikers; it contains three congressionally designated wilderness areas of inspiring grandeur and is a source of water for the cities of the area. The Long Range Plan will need to minimize the impacts on these publicly owned recreational areas of significant value.

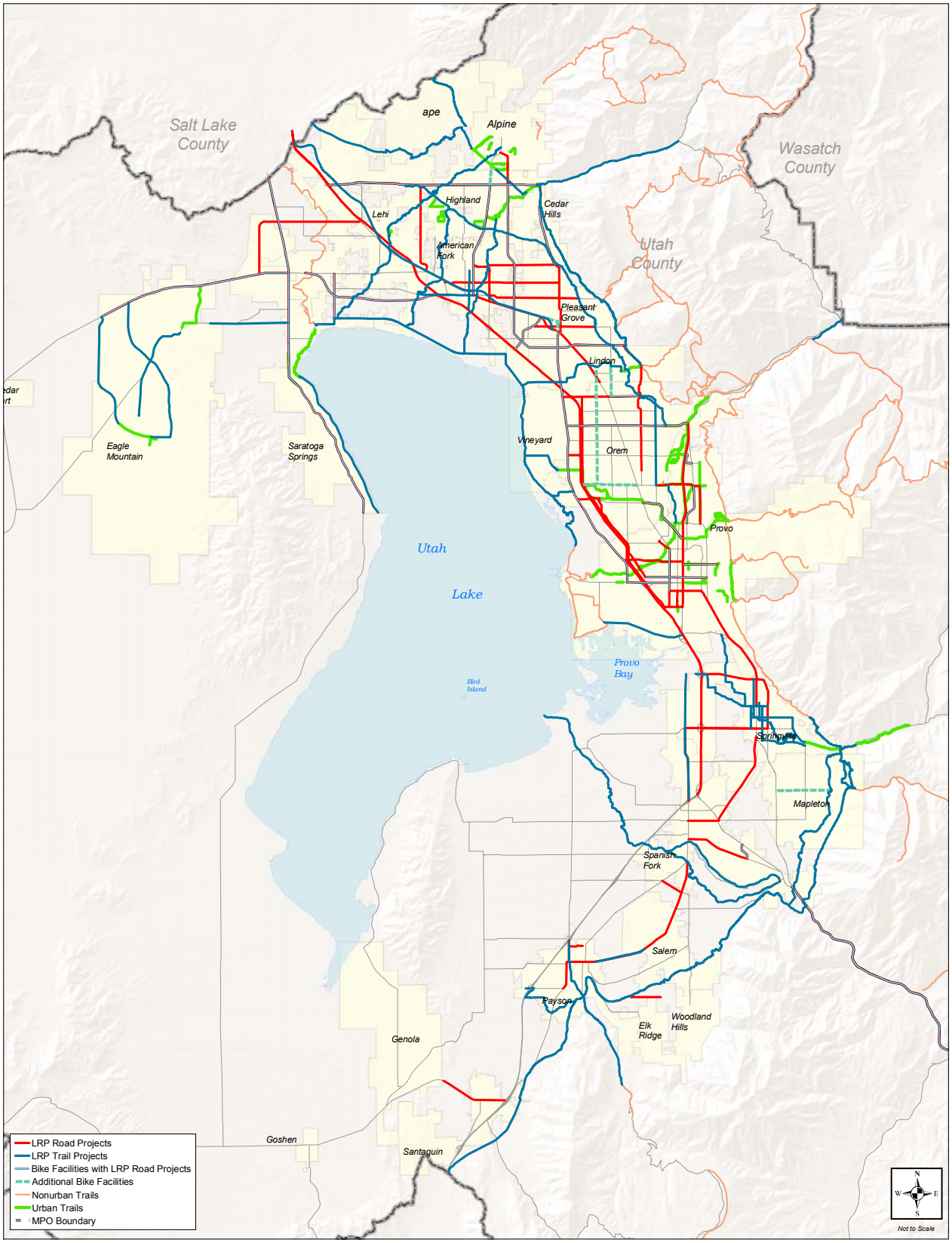
EXISTING TRAIL IMPACTS AND INTERSECTION OPPORTUNITIES

LRP #	Existing Trail Impacts and Intersection Opportunities and Long Range Plan Project	Under/Overpass/ Intersection Construction	May Impact an Existing Trail Facility
HWY-1.1	Main Street, American Fork	X	
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X	X
HWY-1.3	Geneva Road, Pleasant Grove	X	X
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs	X	X
HWY-1.5	3500 North, Lehi / 11000 North, Highland	X	X
HWY-1.6	800 North, Orem	X	X
HWY-1.7	Main Street, Payson	X	
HWY-1.11	State Road, Spanish Fork to Salem	X	
HWY-1.12	State Street, American Fork to Lindon	X	
HWY-1.13	University Parkway, Orem to Provo		X
HWY-1.14	US-6, Spanish Fork Canyon	X	
HWY-2.1	100 East, American Fork / Alpine Highway, Highland	X	
HWY-2.2	Canyon Road, Pleasant Grove to Highland	X	
HWY-2.7	Redwood Road, Saratoga Springs		X
HWY-2.13	University Ave, Provo	X	X
HWY-2.14	US-6, Spanish Fork Canyon	X	
HWY-3.1	3500 North Lehi / 11000 North/SR-92 Highland	X	
HWY-3.2	100 North/State Road, Payson	X	
HWY-3.4	500 West, Provo	X	X
ROAD-1.1	700 North, Lindon / 2000 West, Pleasant Grove	X	
ROAD-2.1	Pacific Drive/100 North, American Fork	X	
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	X	X

LRP #	Existing Trail Impacts and Intersection Opportunities and Long Range Plan Project Cont'd	Under/Overpass/ Intersection Construction	May Impact an Existing Trail Facility
ROAD-2.3	Battle Creek Drive, Pleasant Grove	X	
ROAD-2.4	Columbia Lane, Provo	X	X
ROAD-2.6	Independence Ave, Provo	X	X
ROAD-2.7	800 North, Lindon / 1000 South, Pleasant Grove	X	
ROAD-2.8	800 South, Orem / 3700 North, Provo		X
ROAD-2.9	1200 West, Orem	X	X
ROAD-2.10	1600 North, Orem	X	
ROAD-2.11	800/820 North, Provo	X	X
ROAD-2.12	920 South, Provo		X
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove	X	
ROAD-3.2	500 East, American Fork	X	
ROAD-3.3	700 North, American Fork / 2600 North, Pleasant Grove	X	
ROAD-3.6	4800 West, Highland / Canyon Crest, Road Alpine	X	
ROAD-3.7	1200 East, Lehi	X	
ROAD-3.9	800 North, Lindon / 1000 South, Pleasant Grove	X	
ROAD-3.10	1200 East, Lindon / 400 East, Orem	X	X
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove	X	
ROAD-3.17	Provo Canyon Road, Provo	X	X
ROAD-3.19	400 East/1400 North, Springville	X	
ROAD-3.20	400 South, Springville	X	
ROAD-3.21	Timpview Drive, Provo	X	X
FWY-2.1	I-15 Freeway - Lehi to American Fork		X
FWY-3.2	I-15 Freeway - American Fork to Orem		X
FWY-3.3	I-15 Freeway - Orem to Provo		X
FWY-3.5	I-15 Freeway - Provo to Spanish Fork		X

Bonneville Shoreline Trail, Orem

EXISTING TRAIL IMPACTS AND INTERSECTION OPPORTUNITIES



IMPACTS TO OTHER 4(F) PROPERTIES

LRP #	Impacts to 4(f) Properties and Long Range Plan Projects	Recreational Properties	Cemeteries	Churches	Schools	Libraries
HWY-1.3	Geneva Road, Provo to Pleasant Grove	1				
HWY-1.6	800 North, Orem	1			1	
HWY-1.7	Main Street, Payson	1		1		
HWY-1.8	100 East, Pleasant Grove	1	1		1	
HWY-1.11	State Road, Spanish Fork to Salem	1		1	1	
HWY-1.12	State Street, American Fork to Lindon	4		1		
HWY-1.13	University Parkway, Orem to Provo	1		1		
HWY-2.1	100 East American Fork / Alpine Highway Highland	1	1	1		
HWY-2.5	100 West, Payson	1				
HWY-2.8	300 South/Canyon Road, Spanish Fork	1				
HWY-2.9	400 North, Spanish Fork			1	1	
HWY-2.12	Main Street, Springville / 300 South, Provo	1				
HWY-2.13	University Ave, Provo	2		1		
HWY-3.2	100 North/State Road, Payson			1		
HWY-3.4	500 West, Provo	2		1	1	
HWY-3.5	Main Street, Santaquin	1				
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	1				
ROAD-2.3	Battle Creek Drive, Pleasant Grove			1		
ROAD-2.4	Columbia Lane, Provo					
ROAD-2.6	Independence Ave, Provo	1				
ROAD-2.9	1200 West, Orem					
ROAD-2.10	1600 North, Orem			1		
ROAD-2.11	800/820 North, Provo			1		
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove	1		1		
ROAD-3.3	700 North, American Fork / 2600 North, Pleasant Grove	1		1		
ROAD-3.5	Battle Creek Drive, Pleasant Grove			1		
ROAD-3.6	4800 West, Highland / Canyon Crest Road, Alpine			1		
ROAD-3.7	1200 East, Lehi			1		
ROAD-3.10	1200 East, Lindon / 400 East, Orem			4	1	
ROAD-3.14	200 North, Provo			1		
ROAD-3.19	400 East/1400 North, Springville				1	
ROAD-3.21	Timpview Drive, Provo	1				

LRP #	Impacts to 4(f) Properties and Long Range Plan Projects Cont'd	Recreational Properties	Cemeteries	Churches	Schools	Libraries
BUS-1.3	Bus Rapid Transit, Provo/Orem	**5**		**2**	**4**	**1**
FWY-3.2	I-15 Freeway - American Fork to Orem	**3**				
FWY-3.3	I-15 Freeway - Orem to Provo	**1**				

Conclusion

It is US national policy: that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. In the U.S. Department of Transportation Act of 1966, a special provision was included to provide protection to these resources. It is known as Section 4(f), and it stipulates that the FHWA will not approve any program or project which requires the use of any publicly owned public park, recreation area, or wildlife or waterfowl refuge, or any land from an historic site of national, state, or local significance unless:

- There is no feasible and prudent alternative to the use
- All possible planning to minimize harm resulting from such use is included.

ENVIRONMENTAL IMPACTS AND THE LONG RANGE TRANSPORTATION PROJECTS

FARMLAND IMPACTS

The MPO Area has several important tracts and islands of unique, important, and prime farmland as mapped and identified by the *Important Historical Farmlands of Utah*.[1] The Utah State University Extension Services, the Local Soil Conservation Service, also participated in defining large tracts of important farmland that would be ideal to preserve. These large tracts have become important because of economies of scale in operational expense. Small tracts of important farmland are not economically productive and therefore not considered as important to retain as the identified large tracts. These large tracts of farmland are characterized by high quality soils, available water for irrigation, proper slope, and aspect. Most of these areas are outside current city limits and have low-density housing adjacent. Within the MPO area three large tracts have been identified as areas to preserve if possible:

Apple Orchards, Genola

1. West of Lehi City and south of a development currently referred to as Thanksgiving Point
2. West of American Fork City, south to Vineyard City
3. West of I-15 in Springville; Spanish Fork City; Santaquin and Genola west to Utah Lake

The farmland of Utah County has significance beyond its local boundaries. While most of the alfalfa and feed grains such as, winter wheat, and sweet corn are used locally, the specialty crops of apples, pears, and cherries find their way into national and international markets.

Several proposed new roadway projects in the Long Range Transportation Plan will impact important and prime farmlands located in large retention tracts. These impacts include use of farmland for rights-of-way and the division of large contiguous pieces into smaller units. Smaller units are not as economically viable for farming. See the table for specific projects and associated impact.

Combine winter wheat, Lehi

1 CD Rom produced by Utah State University Extension Service, November 1994.

FARMLAND IMPACTS

LRP #	Farmland Impacts and Long Range Plan Projects	Impacts large tract of prime farmland	Impacts tract of important farmland	Bi-sects large tract of prime farmland
HWY-1.2	Main Street, American Fork / 1000 South, Lehi		X	X
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs		X	X
ROAD-1.1	700 North, Lindon / 2000 West, Pleasant Grove		X	X
ROAD-3.8	2300 West, Lehi		X	X
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove			X
P&R-1.3	I-15/Main Street Park & Ride, American Fork	X		
P&R-1.4	I-15/Pleasant Grove Interchange Park & Ride	X	X	

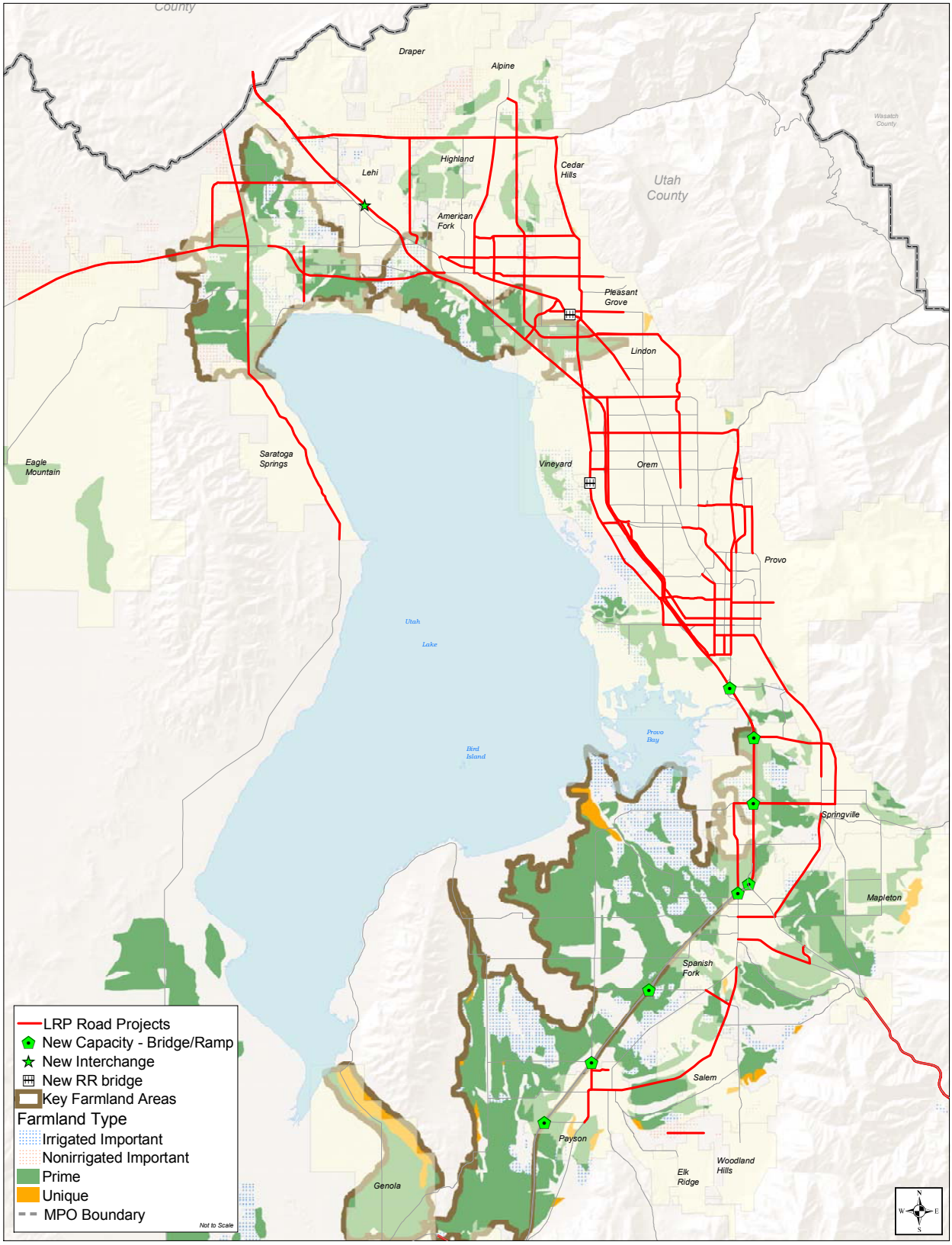
Conclusions

The Farmland map shows how much of Utah County is farmland. Historically this area has been entirely agriculture as there are large areas of high quality soil. The increase in population has led to the conversion of much of the land to residential and the water to industrial and residential uses.

- If the remaining agricultural land is to be kept for this use then the transportation facilities dividing large parcels should be relocated or not built.

Transfer of development rights, open space preservation program through the Utah's Quality Growth commission should be pursued for these large parcels and transportation facilities designed to preserve them.

FARMLAND IMPACTS MAP



FISH AND WILD LIFE IMPACTS

The entire MPO area has been identified as important migratory waterfowl habitat described as the "Intermountain West Unit," by the U.S. Department of Interior in the *1994 Update to the North American Waterfowl Management Plan*. This plan's primary objective is to preserve habitat and increase duck, goose, and swan populations nationwide. Roadway improvements should avoid or minimize any wetland or waterfowl habitat taken. In addition, sections of important farmland should be preserved to act as migratory rest and feeding areas.

The Utah Division of Wildlife Resources has also mapped the entire MPO area for fish, mammal, reptile, and amphibian habitats. Primary areas of concern are the bench or foothill locations, riparian or wetlands and water bodies. Foothills occur where the urbanized area meets the Uinta National Forest in the eastern edge of the MPO area. These sagebrush and scrub oak covered hills provide critical habitat to mule deer, elk, mink, and snowshoe hare both in the winter and year long. Also several species of birds use the foothill area for yearlong habitat, such as California Quail, Ring Neck Pheasant, and Ruffed Grouse.

Important fisheries in the MPO area are the upper portion of the Spanish Fork River, the entire stretch of the Provo and Jordan Rivers, portions of Hobble Creek near Springville, portions of the American Fork River, and Utah Lake. Selected species include the June Sucker, Bonneville Cutthroat Trout, Utah Sucker, Utah Chud, and the Speckled Dace.

Several threatened and endanger species, both flora and fauna, exist within the MPO area. Coordination with the U.S. Fish and Wild Life Service and the Utah Division of Wild Life Resources determined the presence of the following threatened and/or endangered species.

- *Bald Eagle* (Haliaeetus leucocephalus) Status: Threatened - Wintering Populations (only three known nesting pairs in Southeastern Utah)
- *Clay Phacelia* (Phacelia argillacea) Status: Endangered - located near Tucker Rest Area in Spanish Fork Canyon.
- *Peregrine Falcon* (Falco peregrinus) Status: De-listed - Nests in Utah County
- *Utah Valvata Snail* (Valvata Utahensis) Status: Endangered & thought to be extinct
- *Ute Ladies'-tresses* (Spiranthes diluvialis) Status: Threatened
- *June Sucker* (Chasmistes liorus) Status: Endangered - Critical habitat in the MPO area. The Utah Division of Parks and Recreation created a June Sucker recovery plan for the U.S. Fish and Wildlife Service. The plan involves the lower 7.8 km (4.90 miles) of the main channel of the Provo River, Provo Bay, and Utah Lake.


Peregrine Falcon

- *Deseret Milkvetch* (Astragalus desereticus) Status: Threatened found near Birdseye on Highway 89
- Western Yellow-billed Cuckoo (Coccyzus americanus occidentalis) Candidate Species

The following species may occur within a project area and are managed under Conservation Agreements and Strategies. Conservation Agreements are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to proactively conserve and protect species in decline.

- *Spotted Frog* (Rana pretiosa)
- *Bonneville Cutthroat Trout* (Oncorhynchus clarki utah)

In coordination with the two responsible agencies listed above, threatened and endangered species and designated and proposed critical habitats, as of April 1996 were mapped and compared with the

proposed improvement projects. Roadway improvement projects that may affect threatened and endangered species and/or important habitat are listed on the Fish and Wildlife Impacts table. To portray riparian habitat (for illustrative purposes only) a 400 meter buffer was placed on those streams known through visual observation to have a significant associated wetland component and a 0.2-mile buffer on the remaining priority streams.

FISH AND WILDLIFE IMPACTS TABLE

LRP #	Fish and Wildlife Impacts and Long Range Plan Projects	Utah Department of Natural Resources' Essential Wetlands a Possible migratory flyway habitat impact	Possible fishery/ reptile/ aquatic habitat impact	Possible mammal habitat impact	400 meter priority UDWR Riparian corridor impact	Possible threatened or endangered species impact
HWY-1.3	Geneva Road, Provo to Pleasant Grove	X	X		X	
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs		X		X	
HWY-1.6	800 North, Orem	X	X		X	
HWY-1.11	State Road, Spanish Fork to Salem	X	X		X	
HWY-1.13	University Parkway, Orem to Provo	X			X	X
HWY-1.14	US-6 Spanish Fork Canyon	X	X	X	X	
HWY-2.2	Canyon Road, Pleasant Grove to Highland			X		
HWY-2.11	1400 North, Springville	X			X	
HWY-2.13	University Ave, Provo	X			X	
HWY-2.14	US-6 Spanish Fork Canyon	X	X	X	X	
HWY-3.4	500 West, Provo	X			X	
HWY-3.7	SR-51, Spanish Fork to Springville	X				
ROAD-1.4	4800 North/Foothill Drive, Provo				X	
ROAD-2.4	Columbia Lane, Provo		X		X	
ROAD-2.6	Independence Ave, Provo		X		X	
ROAD-2.8	800 South, Orem / 3700 North, Provo	X			X	
ROAD-2.11	800/820 North, Provo		X		X	
ROAD-3.8	2300 West, Lehi					X
ROAD-3.14	500 North, Provo					X
ROAD-3.19	400 East/1400 North, Springville				X	X
ROAD-3.20	400 South, Springville				X	
P&R-1.1	800 North/University Ave Park & Ride		X			

LRP #	Fish and Wildlife Impacts and Long Range Plan Projects Cont'd	Utah Department of Natural Resources' Essential Wetlands a Possible migratory flyway habitat impact	Possible fishery/ reptile/ aquatic habitat impact	Possible mammal habitat impact	400 meter priority UDWR Riparian corridor impact	Possible threatened or endangered species impact
BUS-2.1	Commuter Rail, Provo to Salt Lake County Line		X		X	
FWY-3.3	I-15 Freeway - Orem to Provo	X			X	
FWY-3.5	I-15 Freeway - Provo to Spanish Fork	X			X	

Conclusion

- Listed are all currently known endangered species. Their presence should indicate that sufficient funds be provided to include mitigation of the project.
- Relocation of a transportation facility to a right-of-way adjacent to but not impacting an endangered species should be considered and is recommended.
- Fish and Wildlife and the Army Corps of Engineers should be contacted during the planning of any corridor to determine threaten or endangered species.

GEOLOGIC HAZARDS

1. Liquefaction, Debris Flow, Fault Lines: The Uinta National Forest's steep slopes, created by the Wasatch Fault, run the length of the MPO area. The Wasatch Fault highlights the potential for geologic hazards in the area and the need to consider their potential impact on transportation facilities. As development continues to rise higher on the foothills and towards the shores of Utah Lake several geologic factors should be considered when planning a new highway project. Fault lines of known earthquake activity and its buffer, slope hazard or debris flow areas, and high potential liquefaction areas should be avoided. All of these elements are present in the MPO area. Safeguards may be implemented during the project's design phase to lessen the impact of these possible hazards. The "Geologic Hazards Map" illustrates the geologic hazards in relation to the proposed projects. The following list was generated using a comparison of known geologic hazards and the proposed transportation projects.

GEOLOGIC HAZARDS

LRP #	Geologic Hazards and Long Range Plan Projects	Liquefaction High Potential	Slope / Debris Flow Area	Earthquake Fault Line / Buffer Zone
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X		
HWY-1.3	Geneva Road, Provo to Pleasant Grove	X		
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs	X		
HWY-1.5	3500 North, Lehi / 11000 North, Highland			X
HWY-1.9	Provo Center, Provo	X		
HWY-2.2	Canyon Road/SR-146, Pleasant Grove to Highland		X	X
HWY-2.10	400 South, Springville	X		X
HWY-2.11	1400 North, Springville	X		
HWY-2.12	Main Street, Springville / State Street, Provo	X		X

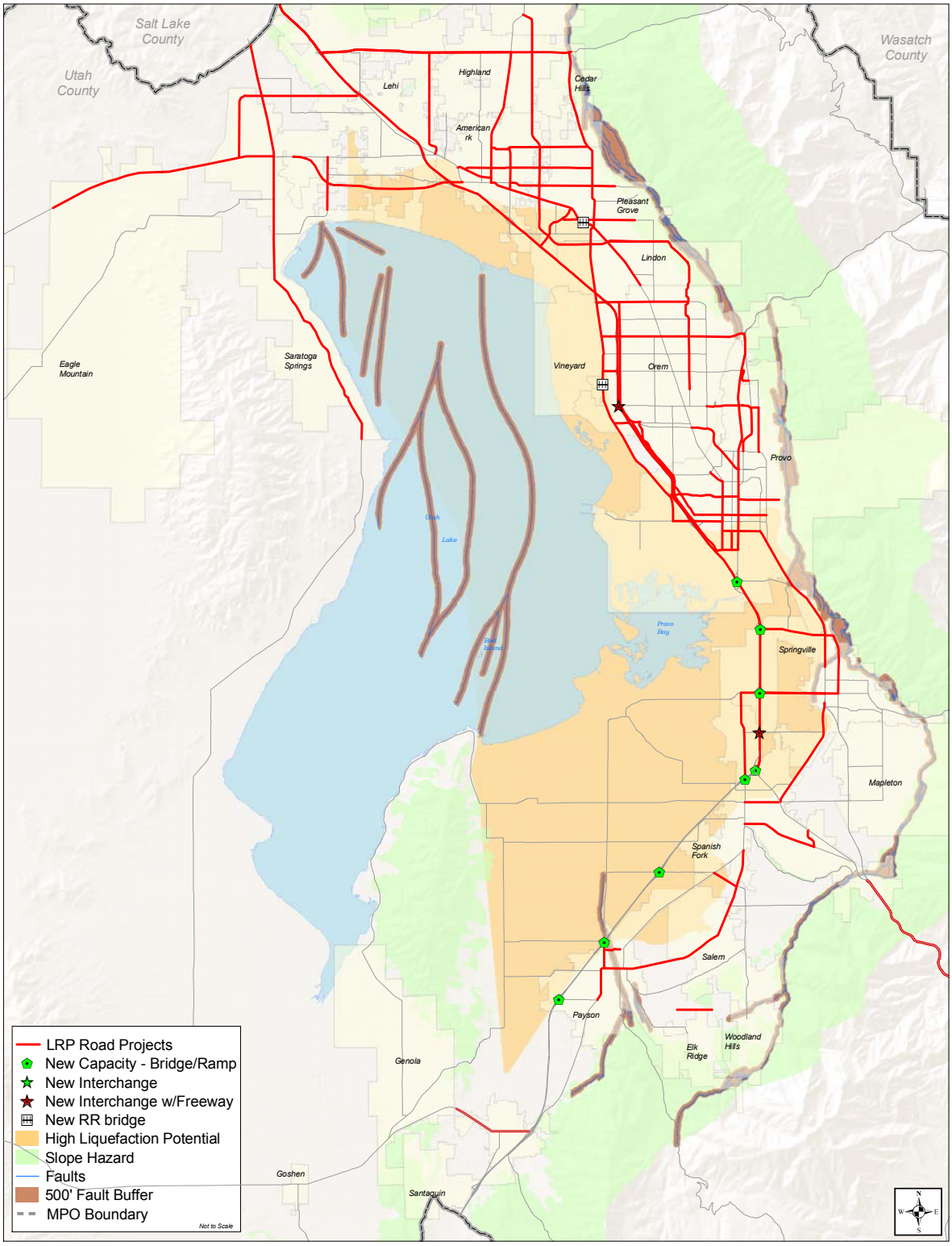
LRP #	Geologic Hazards and Long Range Plan Projects Cont'd	Liquefaction High Potential	Slope / Debris Flow Area	Earthquake Fault Line / Buffer Zone
HWY-2.13	University Ave, Provo	X		
HWY-3.2	100 North/State Road, Payson			X
HWY-3.3	300 South, Provo	X		
HWY-3.7	SR-51, Spanish Fork to Springville	X		
HWY-3.6	400 South, Springville	X		
ROAD-1.1	700 North, Lindon / 2000 West, Pleasant Grove	X		
ROAD-1.3	Pleasant Grove Blvd, Pleasant Grove	X		
ROAD-1.7	Woodland Hills Drive, Utah County	X		
ROAD-2.3	Battle Creek Drive, Pleasant Grove	X		
ROAD-2.5	Freedom Blvd, Provo	X		
ROAD-2.7	800 North, Lindon / 1000 South, Pleasant Grove		X	
ROAD-2.12	920 South, Provo	X		
ROAD-3.9	800 North, Lindon / 1000 South, Pleasant Grove		X	
ROAD-3.10	1200 East, Lindon / 400 East, Orem		X	
ROAD-3.12	600/700 North, Payson			X
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove	X		
ROAD-3.15	500 West, Provo	X		
ROAD-3.18	Main Street, Spanish Fork / 2500 West, Springville	X		
ROAD-3.19	400 East/1400 North, Springville			X
P&R-1.1	800 North/University Ave Park & Ride, Orem		X	X
P&R-2.1	10800 West Park & Ride, Saratoga Springs	X		
P&R-1.3	I-15/Main Street Park & Ride, American Fork	X		
P&R-1.4	I-15/PG Interchange Park & Ride, American Fork	X		
P&R-2.2	I-15/1400 North Interchange Park & Ride, Springville	X		
P&R-2.4	I-15/400 South Interchange Park & Ride, Springville	X		
BUS-2.1	Commuter Rail, Provo to Salt Lake County Line	X		
BUS-1.3	Bus Rapid Transit, Provo/Orem	X		
BUS-1.5	Provo Intermodal Center	X		
FWY-2.1	I-15 Freeway - Lehi to American Fork	X		
FWY-3.2	I-15 Freeway - American Fork to Orem	X		
FWY-3.3	I-15 Freeway - Orem to Provo	X		
FWY-3.5	I-15 Freeway - Provo to Spanish Fork	X		

Conclusion

- One of the primary concerns that should be addressed when planning a facility in an area prone to geologic hazards is to ensure that there are alternative routes providing similar access.
- Alternative rights-of-way in less unstable areas should be considered.

- Engineering and design should include mitigation for such conditions.
- Funding of projects should include sufficient funds for mitigation measures.

GEOLOGIC HAZARDS IMPACTS MAP



EPA Study Sites

The potential for hazardous waste in project rights-of-way is a concern in the setting of transportation facilities, because the purchase of a contaminated site or the purchase of property split from a contaminated parcel may result in the public agency becoming financially liable for hazardous waste clean-up. This liability, if it falls to the transportation agency, could create significant financial burdens and project delays.

To identify projects that could conflict with hazardous waste sites, Mountainland staff compared the location of Long Range Plan projects with the location of hazardous waste sites listed in the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). CERCLIS is the database used by the EPA to track superfund progress at potential and confirmed hazardous waste sites. Inclusion in CERCLIS simply means EPA has been notified of the possibility of some release of hazardous substance to the environment, thereby triggering the need for a preliminary assessment. The "EPA Study Sites Map" illustrates the currant inventory of EPA CERCLIS site for the MPO area. The potentially impacted projects are listed on the Possible EPA Site Impact table.

POSSIBLE EPA SITE IMPACT

LRP #	EPA Site Impacts and Long Range Plan Projects	EPA Site Name	EPA Identification Number	Address
HWY-1.3	Geneva Road, Provo to Pleasant Grove	Parish Chemical Company, Utah	UTD072988173	145 North Geneva Road, Vineyard, 84058
HWY-1.12	State Street, American Fork to Lindon	Pleasant Grove Canning Company, Utah	UT 000 111 931 2	478 Industrial Drive, Pleasant Grove, 84062
HWY-1.14	US-6, Spanish Fork Canyon	Trojan Corp	UT I-15 Freeway, Spanish Fork to Payson 1310962	Mouth of Spanish Fork Canyon
HWY-2.14	US-6, Spanish Fork Canyon	Trojan Corp	UT I-15 Freeway, Spanish Fork to Payson 1310962	Mouth of Spanish Fork Canyon
ROAD-2.6	Independence Ave, Provo	Ford Construction, Utah	UT 000 066 186 8	820 North 2000 West, Provo, 84601
P&R-1.2	Downtown Pleasant Grove Park & Ride	Pleasant Grove Canning Company, Utah	UT 000 111 931 2	478 Industrial Drive, Pleasant Grove, 84062
BUS-1.1	Pleasant Grove Transit Hub	Pleasant Grove Canning Company, Utah	UT 000 111 931 2	478 Industrial Drive, Pleasant Grove, 84062
FWY-3.2	I-15 Freeway - American Fork to Orem	Gold Dome Mining and Milling Site	UTD988066486	200 North 330 West Orem, 84057

Conclusion

- The presence of an EPA site may significantly increase the cost of any project. Clean up and mitigation cost should be included during the projects cost estimating.
- While increasing project costs a transportation project can be the catalyst for removing a negative environmental condition and spur further clean up and reclaiming of land for development. Appropriate land uses and community participation in reclaiming a site should be sought in the early planning process thru completion.

Fuel Tank Remediation

WATERBODY AND FLOODPLAIN MODIFICATION

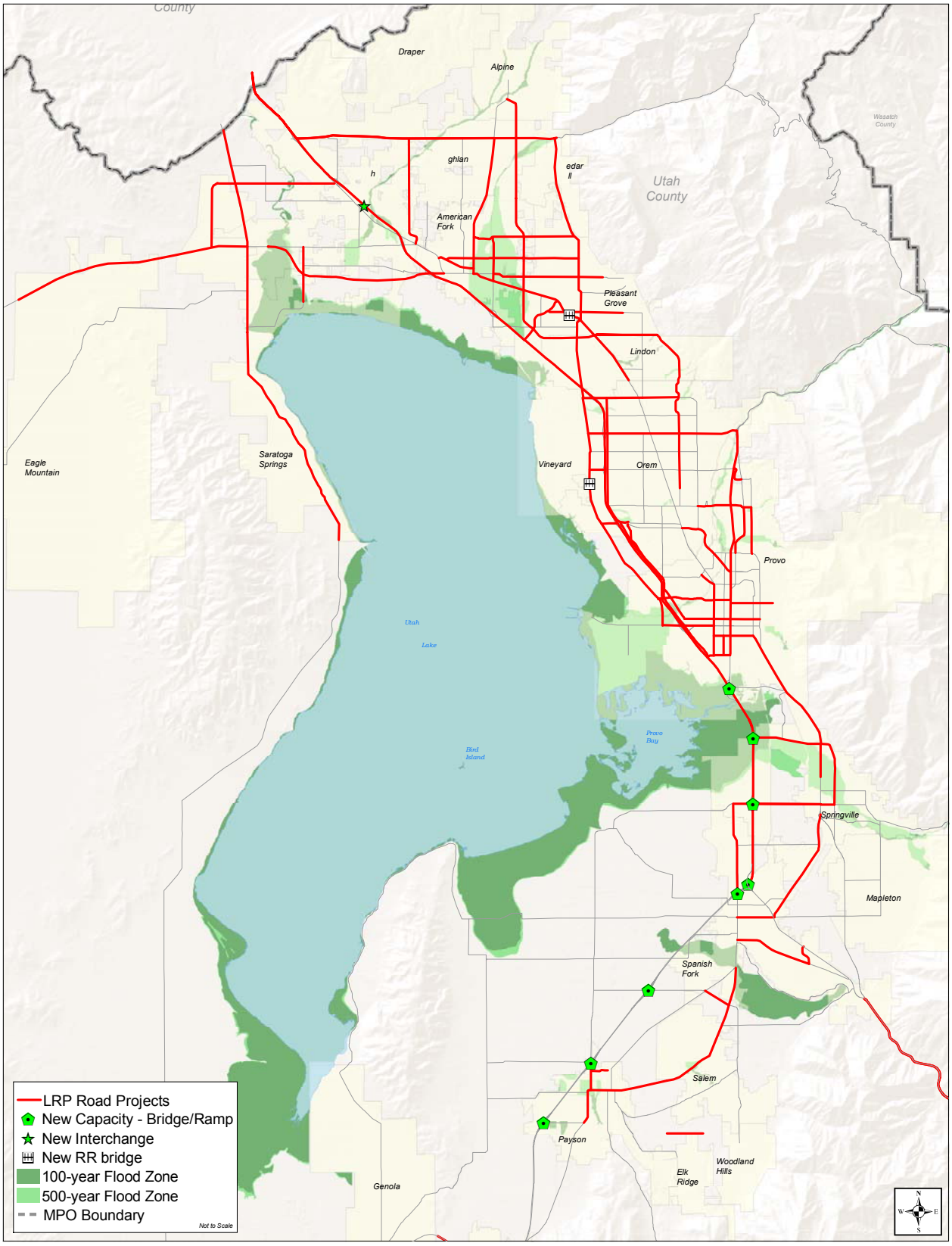
Floodplains and water bodies help to accommodate flooding and moderate erosion in a water way. Highway projects can impact a water body in many ways including: disturbing ground within 20 feet of natural or semi-natural rivers and streams, realigning or channeling meandering rivers and streams, placing obstructions in floodplains and realigning or channeling meandering rivers and streams, and constructing in unstable floodplain crossings.

Specific impact assessments and mitigation measures will be made during the environmental evaluation and review phase of the project development process. The following projects are identified as crossing creeks and rivers, areas with surface waters or floodplains as inventoried by the Federal Emergency Management Agency.

WATERBODY AND FLOODPLAIN IMPACT TABLE

LRP #	Waterbody and Floodplain Impacts and Long Range Plan Projects	Floodplain / Waterbody Impacts
HWY-1.3	Geneva Road, Provo to Pleasant Grove	Provo River
HWY-1.4	2100 North, Lehi / 11600 West, Saratoga Springs	Jordan River / 100 Year FEMA Flood Zone
HWY-1.5	3500 North, Lehi / 11000 North, Highway	Murdock Canal / 100 Year FEMA Flood Zone
HWY-1.6	800 North, Orem	Provo River / Murdock Canal
HWY-1.11	State Road, Spanish Fork to Salem	Salem Pond / 100 Year FEMA Flood Zone / Spanish Fork River
HWY-1.12	State Street, American Fork to Lindon	American Fork River
HWY-1.13	University Parkway, Orem to Provo	Provo River
HWY-2.1	100 East, American Fork / Alpine Highway, Highland	Murdock Canal
HWY-2.2	Canyon Road, Pleasant Grove to Highland	Murdock Canal
HWY-2.11	1400 North, Springville	100 Year FEMA Flood Zone
HWY-3.1	3500 North, Lehi / 11000 North, Highland	Murdock Canal / Dry Creek
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	Murdock Canal / American Fork River
ROAD-2.4	Columbia Lane, Provo	Provo River
ROAD-2.6	Independence Ave, Provo	Provo River
ROAD-2.7	800 North, Lindon / 1000 South, Pleasant Grove	Murdock Canal
ROAD-2.8	800 South, Orem / 3700 North, Provo	Provo River
ROAD-2.10	1600 North, Orem	Murdock Canal
ROAD-2.11	800/820 North, Provo	Provo River
ROAD-3.1	300 North, American Fork / 1800 North Pleasant Grove	American Fork River
ROAD-3.3	700 North, American Fork / 2600 North, Pleasant Grove	American Fork River
ROAD-3.4	Main Street/50 South, American Fork / 1100 North, Pleasant Grove	Murdock Canal
ROAD-3.7	1200 East, Lehi	Murdock Canal / Dry Creek
ROAD-3.10	1200 East, Lindon / 400 East, Orem	Murdock Canal
P&R-1.1	800 North/University Ave Park & Ride, Orem	Provo River

WATERBODY AND FLOODPLAINS MAP



LRP #	Waterbody and Floodplain Impacts and Long Range Plan Projects Cont'd	Floodplain / Waterbody Impacts
P&R-2.2	I-15/1400 North/SR-75 Interchange Park & Ride	100 Year FEMA Flood Zone
BUS-2.1	Commuter Rail, Provo to Salt Lake County Line	Provo River / Jordan River / American Fork River / 100 Year FEMA Flood Zone
FWY-3.2	I-15 American Fork to Orem	100 Year FEMA Flood Zone
FWY-3.3	I-15 Freeway - Orem to Provo	Provo River / 100 Year FEMA Flood Zone
FWY-3.5	I-15 Freeway - Provo to Spanish Fork	100 Year FEMA Flood Zone

Conclusion

- Special emphasis should be given during the public input phase of these projects to increase public awareness of this danger. Floodplains are not often recognized as a danger in this area as it is very arid and floods are few and far between. However their effects may be devastating.
- Alternate routes during flood times should be planned.
- Bridge construction should include break away (one side) and other flood construction considerations.
- Land uses near floodplains should be appropriate i.e. no hospitals or schools.

50-Year Flood Event

- Streams and rivers that are crossed should be crossed at ninety degree angles.
- Streams and rivers should not be channeled by a roadway. Sufficient space for a meander line should be included in the distance a facility is planned from a stream or river.

WATER QUALITY IMPACTS

Utah State's Non-point Source Management Plan, the federal Clean Water Act and various other governmental regulations require the monitoring of water resource impacts and management in the MPO area. Water quality impacts associated with roadway project vary according to traffic volumes, pavement width additions and the recharge capability of the surrounding soils.

Vehicle miles traveled roughly indicate the amount of oil and other hazardous materials from cars that are deposited on the roadway and subsequently washed into the watershed with the next rainfall. The amount of pavement added to a roadway roughly correlates with increased salt usage in the winter and the elimination of permeable surfaces where precipitation is normally allowed to slowly filter into the area's aquifers. The recharge capabilities of the soils surrounding the project and the project's proximity to well recharge areas indicate the likelihood of the roadway runoff to contaminate drinking water.

Utah County has in the past used ground slag, a by-product of steel production, for road sanding. This practice was recently stopped due to the negative air quality impacts associated with dust participles. Salt is rarely used in agricultural areas due to potential damage to fruit trees and crop productions. Currently sand, which is swept after each snow melt, is prevalently used throughout the area.

Projects that potentially impact area water quality are listed below in the Water Quality Impacts Table. These projects are listed because they require the addition of two or more lanes increasing both pavement width and traffic carried, and they are located in a well recharge, spring or primary recharge area.

WATER QUALITY IMPACTS

LRP #	Projects (In proximity to a water supply)	Well	Spring
ROAD-3.8	2300 West, Lehi	X	

Water quality impact assessments and mitigation measures will be determined utilizing the map titled, "Wetlands, Springs, and Wells Impacts."

Conclusion

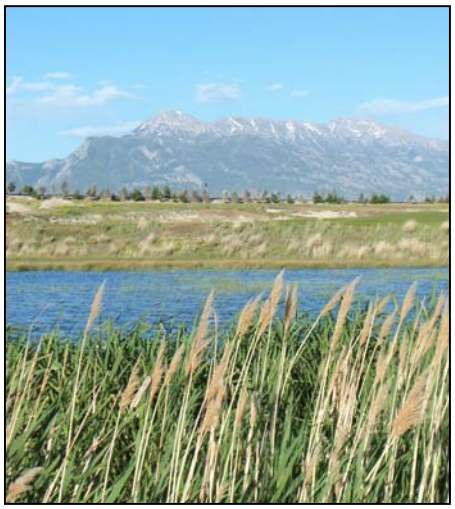
- Area recharge maps and other measures should be used during the environmental phase of the individual project development process.
- During project design, storm water removal facilities may be used to limit hazardous material seepage into ground water and retention ponds may be used to minimize the introduction of silt and other participles into streams and other waterbodies.

WETLAND IMPACTS

Wetlands serve critical environmental functions, including flood control, water purification and the provision of habitat for fish and wildlife. Wetlands can be defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The significance of roadway wetland impacts varies based upon the projects characteristics, the size and quality of the wetlands area, and the level to which the wetlands have already been disturbed by people. A project may generally impact wetlands by destroying the immediate footprint of the planned facility or by providing a barrier between adjacent wetland areas. Listed in the Wetlands Impacts table are projects that may impact both wetlands from the National Wetlands Inventory (NWI) and Essential Wetland as identified in the Utah Division of Wildlife Resources Central Region Wetlands Conservation Strategy. The NWI of the U.S. Fish & Wildlife Service produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. Federal, State, and local agencies, academic institutions, U.S. Congress, and the private sector use the National Wetlands Inventory Center information. The Utah Division of Wildlife Resources identified eight essential wetlands areas in Utah county including:

1. Utah Lake and associated wetland complexes (North Shore, Provo Bay, Skipper Bay, Goshen Bay, Benjamin Slough, etc.)
2. Powell Slough WMA ownership conflicts
3. Potential acquisitions within Utah Lake Wetland Preserve Boundary
4. Isolated wetland complexes and wet meadows along east bench area
5. Fairfield wetlands
6. Holladay Spring
7. American Fork Spring Complex (currently under construction for commercial development)
8. Riparian areas along UDWR Priority Streams

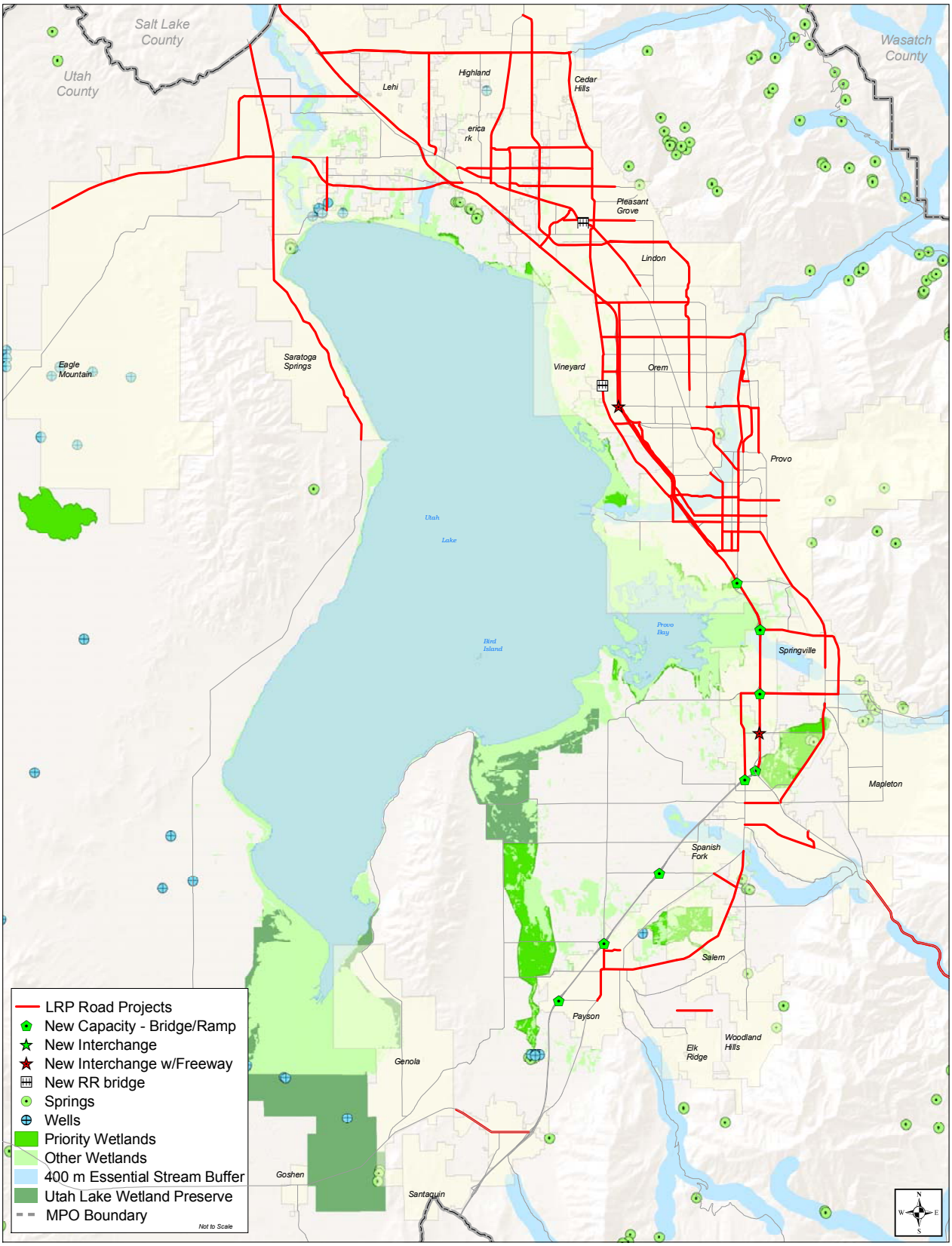


Jordan River Wetlands

Essential Wetland Areas were identified and targeted trough a process of layering the following data:

1. National Wetlands Inventory (NWI) maps and Gap Analysis Program (GAP) coverage of wetland-associated habitats as determined by the Utah DNR.
2. Species distribution/habitat relationships and Threatened & Endangered species status.
3. Property/real estate at-risk status determinations.

WETLANDS, SPRINGS, AND WELLS IMPACTS MAP



WETLANDS IMPACTS

LRP #	Wetlands Impacts and Long Range Plan Projects	National Wetland Inventory	Utah Department of Natural Resources' Essential Wetlands
HWY-1.2	Main Street, American Fork / 1000 South, Lehi	X	
HWY-1.3	Geneva Road, Provo to Pleasant Grove	X	X
HWY-1.4	2100 North Lehi / 11600 West Saratoga Springs	X	
HWY-1.5	3500 North, Lehi / 11000 North, Highland	X	
HWY-1.6	800 North, Orem	X	X
HWY-1.9	Provo Center, Provo	X	
HWY-1.11	State Road, Spanish Fork to Salem	X	X
HWY-1.12	State Street, American Fork to Lindon	X	
HWY-1.13	University Parkway, Orem to Provo		X
HWY-1.14	US-6-Spanish Fork Canyon		X
HWY-2.7	Redwood Road, Saratoga Springs	X	
HWY-2.10	400 South, Springville	X	
HWY-2.11	1400 North, Springville	X	X
HWY-2.13	University Ave, Provo	X	X
HWY-2.14	US-6-Spanish Fork Canyon		X
HWY-3.4	500 West, Provo		X
HWY-3.6	800 South, Orem / 3700 North, Provo		X
HWY-3.7	SR-51, Spanish Fork to Springville		X
ROAD-1.1	700 North Lindon / 2000 West Pleasant Grove	X	
ROAD-1.2	1600 North, Orem	X	
ROAD-1.5	Sandhill Road, Orem	X	
ROAD-1.7	Woodland Hills Drive, Utah County	X	
ROAD-2.2	1100 East, American Fork / 4800 West, Highland	X	
ROAD-2.3	Battle Creek Drive, Pleasant Grove	X	
ROAD-2.4	Columbia Lane, Provo		X
ROAD-2.6	Independence Ave, Provo	X	X
ROAD-2.9	1200 West, Orem	X	
ROAD-2.11	800/820 North, Provo	X	X
ROAD-3.1	300 North, American Fork / 1800 North, Pleasant Grove	X	
ROAD-3.2	500 East, American Fork	X	
ROAD-3.7	1200 East, Lehi	X	
ROAD-3.8	2300 West, Lehi	X	
ROAD-3.13	Pleasant Grove Blvd, Pleasant Grove	X	
ROAD-3.14	200 North, Provo	X	
ROAD-3.18	Main Street, Spanish Fork / 2500 West, Springville	X	
FWY-3.3	I-15 Freeway - Orem to Provo	X	X
FWY-3.5	I-15 Freeway - Provo to Spanish Fork		X

Special consideration should be given to impact avoidance or mitigation with these projects. Wetland delineation and jurisdictional wetland impact assessments and mitigation measures will be determined utilizing the following map and other measures during the environmental evaluation and review phase of the individual project development process.

Conclusion

- Sufficient funds should be included in all requests to provide mitigation for wetlands.
- Wetland areas should be avoided if at all possible and rights-of-way need not be straight, curves around wetlands may work well.
- No development of land in wetland areas should be allowed.
- Banking wetlands can help with future mitigation efforts.
- Using no access lines to restrict accompanying land development.

CONCLUSION

The Community Impacts Assessment section outlines the many ways in which transportation facilities can impact our social, economic, and material lives. The projects in the Long Range Plan can be followed throughout the section and implementing agencies should become aware of the potential needs to mitigate projects in their communities.

This community and environmental impact assessment is not complete environmental review for the project proposed, but it is a general indicator of potential problems. Early identification of problem areas should aid in the design phase of project development and help alleviate the costs associated with problematic alignments of corridors that could be adjusted in this early planning stage.

FINANCIAL PLAN

FINANCIAL PLANNING

The Transportation Equity Act for the 21st Century (TEA-21) is the current 6-year federal transportation bill that funds and regulates all federal transportation activities. One requirement of TEA-21 is that the long range transportation plan be fiscally constrained. The purpose of this requirement is to ensure that the recommended improvements included in the long range plan can be implemented and that the air quality benefits assumed for the implementation of the plan are realistic. Estimates of emission reduction are needed for the air quality conformity analysis required by TEA-21 and the Clean Air Act amendments of 1991.

This chapter documents the financial plan for Utah Valley Metropolitan Planning Organization Long Range Transportation Plan. To allow for air quality requirements, the long range plan study area includes all of Utah County. Potential revenue sources are summarized and estimates of future revenues from these sources are made. The costs to meet the projected needs of the transportation plan for the study area through the year 2030 are estimated. These costs include those required to meet the needs identified in the long range plan as well as the costs required for general administration and the operation and maintenance of the existing transportation system.

PROJECTED TRANSPORTATION REVENUE

Mountainland Association of Governments, in cooperation with the Utah Department of Transportation, and the Utah Transit Authority developed estimates of projected revenues based on revenue sources that should be available for transportation improvements through the year 2030. Included in these estimates are federal, state, local, and private sources for highway and transit improvements. All projects that are regionally significant (highways on the Functional Classification System, transit, etc.) are listed in the plan. Since air quality conformity is based on the Utah County boundary, funding projections are derived using countywide data instead of the MPO planning boundary area data. Separate efforts are made to estimate revenue available to Mountainland, UDOT, UTA, and the local municipalities.

Revenue sources available to UDOT include federal funds, state gas tax, state general funds (only needed to pay off the Centennial Highway Fund (CHF) through 2017), and private sources such as new development and impact fees. TEA-21 increased federal highway funding in Utah by approximately 50 percent over the previous transportation bill. Federal and state funds allocated in 2003 are used as a base with a 3% annual growth rate thereafter. In addition, a five-cent per gallon increase in the gas tax was assumed every six years. It is assumed that state general funds will only contribute to pay off the current bonding for the Centennial Highway Fund program through 2017 with projects from the program being completed by 2007.

Revenue sources available for transit include federal funds, transit sales tax, fare collection, and other sources. Assumed in the plan is a ¼ cent increase in the sales tax collected by UTA starting in 2004. This raises the total transit sales tax in Utah County to ½ cent per dollar spent. Federal transit funds are assumed to grow by 4.25% per year.

Local transportation projects generally have four sources of revenues available: federal funds through Mountainland and the Joint Highway Committee; Class B and C funds from state highway user revenues for counties and cities; local general funds; and private funding.

- **Total available Highway revenue in Utah County = $7.4 billion.**
- **Total available Transit revenue in Utah County = $2.4 billion.**
- **Total Highway and Transit revenue available in Utah County = $9.8 billion**

STATEWIDE HIGHWAY REVENUE

The UDOT planning division developed estimates of the projected revenues that will be available to UDOT statewide through the year 2030. Using this statewide data allows for a more uniform way of planning among all the MPO's and UDOT. These revenues come from federal funds, state highway user revenues, state general funds, and other sources.

1. State Revenue: State of Utah revenue for transportation is primarily generated through highway user fees. The user fees include motor fuel taxes, special fuel taxes, license and other registration fees, a tax on rental cars, and sales taxes. In addition, the state legislature has programmed state general funds to support UDOT projects through 2007. Based on historical growth rates on motor fuel consumption, a growth rate of 3% is used for projecting future funds.

State revenue projections also assume future increases in the state gas tax. The state gas tax has increased from seven cents per gallon to 24.5 per gallon over the last 30-years. The latest increase was a five-cent per gallon increase approved in 1998 (this additional 5-cent tax was used entirely for the Centennial Highway program). This trend would indicate that it is reasonable to expect that the state gasoline tax will be raised by 5 cents per gallon every half decade or so. Based on the past trends, the motor fuel tax was assumed to increase by five cents per gallon every six years, beginning in the year 2005. This will result in a total tax increase of $0.25 per gallon by 2030.

Of the total highway revenue generated, not all state revenue is available to UDOT. A set amount of state revenue for transportation is transferred to other departments and programs. These include; the Utah Highway Patrol, State Tax Commission, Class B & C funds to the municipalities and counties, Centennial Highway Fund program (only through 2017), the match required on federal funds, and other activities.

- **State revenue available statewide after transfers = $16.9 billion.**

2. Federal Revenue: TEA-21, the current 6-year federal transportation bill, established several spending programs for the funding of highway improvements. They include; Interstate Maintenance, National Highway System, Any Area Surface Transportation Program (STP), Safety and Enhancement, and Bridge Replacement. TEA-21 allocated amounts for 2003 were used as a base assumption. A modest growth rate of 3% per year for all federal funds was assumed annually thereafter. TEA-21 expires in September 2003 with a new federal transportation bill to start in October 2003, subject to the approval of the Congress. The state match required on all federal funds that was transferred from state revenue and is included as part of the total federal revenue.

As with state revenues, not all of the federal revenues are available for general UDOT activities. A set amount of federal revenue is transferred to the Centennial Highway program, though 2007 to supplement the current CHF program.

- **Federal revenue available statewide = $7.6 billion.**

3. Centennial Highway Fund: The state legislature in 1997 established the Centennial Highway Fund. This was a major transportation policy decision creating about $2.7 billion for highway funding. It

has since grown to $3.2 billion. The list of projects in the CHF program was a collaboration of UDOT, MPOs, and the legislature with the final approval by the legislature. The passage of this program was originally for the reconstruction of I-15 in Salt Lake County. To obtain consensus in the legislature for the program, other projects were added throughout the state. Utah County received 4% of the total CHF funding. This limited amount of funding has drastically impacted the ability to address the current transportation needs in the county.

The CHF fund includes; federal and state transportation funds, state general funds, and car registration fees. The remainder of CHF funds available from 2003 to 2007 for projects is $1.3 billion. The legislature has not proposed a continuance of CHF after 2007. Current budget issues have extended the retirement date of the CHF program bonds to 2017 extending the bond costs to $2.3 billion. It is assumed that no new general funds will be allocated for transportation projects after 2007. General funds will continue to pay off the bonds until 2017.

- **Centennial Highway program funds available statewide = $3.6 billion.**

4. Total Available Revenue: The total revenue available statewide from state, federal, and Centennial Highway Funds is used for administration and operation of the system, maintenance and preservation of the highways and other facilities, and other programs within UDOT, and the MPOs. The municipalities and counties can also use a small amount of federal funds distributed by the MPOs and the Joint Highway Committee. These revenues are also used for new capacity projects, though administering and preserving the highway system require an extensive amount of the available revenues. This has resulted in a large deficit toward meeting the statewide new capacity needs.

- **Total available revenue statewide = $28.1b**

HIGHWAY REVENUE AVAILABLE IN UTAH COUNTY

Projecting available revenue that will be available to Utah County was done by using the statewide data produced by UDOT and making assumptions of the amount that will be available in the county. These amounts are what will be available for projects, programs, and activities throughout Utah County. These include state and federal revenue, local revenue, and private funds.

1. State and Federal Revenue to UDOT: Estimating what state and federal funds will be available to the area is based on Utah County's proportionate population in the state, which is 17.7%. Though UDOT does not have a set percentage of how state and federal funds are distributed, using the prorate share of funding is a prudent way to project revenue for a 30-year planning document.

- **State revenue available to UDOT in Utah County = $3.0 billion.**
- **Federal revenue available to UDOT in Utah County = $1.0 billion.**

2. Centennial Highway Fund: The amount of funds available to Utah County is based on what the legislature programmed in the original CHF program in 1997 (4.1%). The elimination of the CHF program after 2007, adversely affects Utah County. This is due to the low amount of funds received in the original CHF program coupled with 40% growth in the county during the 90's. The remaining funds available to Utah County include both the project costs ($51.0 million) and the cost to extend the bonds to 2017 ($95.9 million). A new program must be approved in order to proceed with Utah County I-15 reconstruction and the Western Transportation Corridor in north Utah County.

- **The amount of CHF funds available to UDOT in Utah County = $147 million.**

3. Federal Revenues to Utah Valley MPO: Federal funds available to the Utah Valley MPO is derived by what was allocated in 2003 and then using a 3% annual inflation rate. Utah Valley MPO

received $5.8 million or 19% of the total statewide MPO federal funds in 2003. There are three specific federal funds available to Mountainland; Provo/Orem Urban STP, Congestion Mitigation/Air Quality (CM/AQ), and Any Area Spanish Fork STP. These funds are distributed by formula and are administered by UDOT. The MPOs Regional Planning Committee programs these funds on an application basis.

Provo/Orem Urban STP funds can fund highway improvements on the Functional Classified System roads (both state and local owned), trails and pedestrian facilities, and transit improvements within the MPO boundaries. CM/AQ funds can fund projects that benefit air quality within the county. Any Area Spanish Fork STP funds can be used similar to Urban STP funds and can be used within the MPO boundary area. Mountainland federal revenues are spent primarily on local highways, studies, and programs. A small percentage of these funds go to state highways.

- **Utah Valley MPO federal revenue available in Utah County = $249 million**

4. Federal Revenues to Joint Highway Committee: The Joint Highway Committee is charged with recommending the placement of certain federal funds that are available to local jurisdictions. These include; Any Area Non-Urban STP, Any Area Small Urban STP, Bridge Replacement funds, Enhancement, and Railroad Crossings funds. All projects are evaluated on a statewide basis. It is assumed that Utah County will receive a proportionate share of 17.7%. These funds can go to local jurisdictions as well as UDOT.

- **Joint Highway Committee federal revenue available in Utah County = $52 million**

5. Local Revenue: Municipalities and counties play a large role in funding the transportation infrastructure in their jurisdictions. There are basically three revenue sources available for local activities, they include; Class B and C Funds, Local General Funds, and Private and other sources. Bonding is also available, but no attempt to project future funding is made in this plan with regard to local bonding.

a. **Class B and C Funds:** Class B and C funds are distributed by the state to the municipalities and counties and are derived from gas tax revenues. The gas tax revenue, less transfers, is divided as follows; 75% to UDOT, 25% to B and C fund. B and C funds are allocated on a ratio of population and road miles for counties and municipalities in the state. B funds go to counties, C funds to municipalities. These funds can go to any transportation related activity on any local road and is a major source of funding for the municipalities. Based on the current allocation formula Utah County receives approximately 12.7% of the Class B and C funds available statewide. It is assumed in the Long Range Plan that Utah County municipalities and the Utah County will use 20% of the available B and C funds for projects on the Functional Classified Road System.

   - **Class B and C funds available in Utah County = $2.4 billion.**

b. **Local General Fund Revenue:** Municipalities and the county program a significant amount of local general funds for highway maintenance and improvement. Current and past general fund spending on highways by municipalities and the county was examined to project future revenues. Local governments in Utah County are estimated to spend about $14.4 million in 2003. Local expenditures are projected to grow by three percent a year through 2030.

   - **Local General Fund revenue available in Utah County = $404 million.**

c. **Private and Innovative Sources:** Local governments will need to consider several innovative highway funding programs in the future. Many already levy transportation impact fees on new development. In addition, developers are a source of funding for major projects that benefit their development. These and other innovative sources will provide funding over the next twenty years for local highway projects.

   - **Private and Innovative Sources available in Utah County = $112 million.**

The Statewide and Utah Valley MPO Projected Highway Revenue table summarizes the amount of revenues projected to be available in the MPO to 2030.

STATEWIDE AND UTAH VALLEY MPO PROJECTED HIGHWAY REVENUE 2003 - 2030

	PHASE			
STATEWIDE REVENUE	**1**	**2**	**3**	**TOTAL**
State Revenue	2.2 b	5.2 b	9.6 b	16.9 b
Federal Revenue	1.6 b	2.7 b	3.3 b	7.6 b
Centennial Highway Fund	2.3 b	1.2 b	0	3.6 b
REVENUE AVAILABLE STATEWIDE	**6.1 b**	**9.1 b**	**12.8 b**	**28.1 b**

UTAH VALLEY MPO REVENUE	**1**	**2**	**3**	**TOTAL**
State UDOT Revenue	385 m	916 m	1.7 b	3.0 b
Federal UDOT Revenue	224 m	378 m	451 m	1.0 b
Centennial Highway Fund	96 m	51 m	0	147 m
Federal MPO Revenue	50 m	81 m	110 m	249 m
Federal JHC Revenue	12 m	18 m	22 m	52 m
Class B and C Funds	127 m	507 m	1.7 b	2.4 b
Local General Funds	123 m	169 m	112 m	404 m
Innovative/Private Sources	34 m	47 m	31 m	112 m
REVENUE AVAILABLE COUNTYWIDE	**1.1 b**	**2.2 b**	**4.1 b**	**7.4 b**

Phase 1 = 2003-2010, Phase 2 = 2011-2020, Phase 3 = 2021-2030

TRANSIT REVENUE AVAILABLE IN UTAH COUNTY

Revenue for transit service and improvements is projected in corporation with UTA and UDOT. Revenue sources are available from several resources including federal revenue, transit sales tax, fares, and others sources. Federal revenue for transit capital and planning assistance are made available through the Federal Transit Administration (FTA). These funding programs are financed through the federal gasoline tax as well as from general fund monies. Utah Transit Authority (UTA) is the primary recipient of these revenues that are used to make system improvements, introduce new transit technology, increase service, and purchase new equipment.

Revenue for transit improvements was projected anticipating the voter approval of an additional ¼ percent transit sales tax in Utah County in 2004. In addition, federal formula grant funds available for transit were assumed to grow by 4.25% a year. It is assumed that federal funding for major transit improvements, such as Bus Rapid Transit (BRT) and Commuter Rail, will be made available through discretionary funds as a 70% federal match. Finally, fare revenue is projected to cover 20% of bus operating costs and 40% of the Commuter Rail operating costs. Additionally, fare revenues are projected to cover 35% of Bus Rapid Transit operation costs.

1. **Federal Transit Revenue:** Federal revenue for transit capital and planning assistance is made available through FTA. These funding programs are financed through the federal gasoline tax currently going to the mass transit account of the highway trust fund as well as from general fund reserves. These are discussed below.

a. **Section 5307 Formula Grants:** This program provides a block grant to local transit agencies for capital improvements. This revenue can also be used to support preventive maintenance and planning activities. Funding is distributed annually to the Provo/Orem Urbanized Area by a formula based on population, population density, and transit revenue miles of service. Fiscal year 2002 Section 5307 grants were $3 million annually for bus service. MPO staff assumed that this annual amount would grow by 4.25% each year.

   - **Total Section 5307 Formula Grants in Utah County = $180 million.**

b. **Section 5309 Bus and Bus Facility Grants:** This program provides discretionary funding for capital improvement projects, such as the purchase of buses, the construction of park and ride lots, or the construction of operating and maintenance facilities. FTA allocates these funds throughout the country on the basis of need. The federal share of these projects is up to 80%. Because of their discretionary nature, Section 5309 funding for area transit projects varies from year to year. For this plan analysis, Mountainland assumes that UTA will receive the amount they received in 2002 ($440,000) with a 3% annual increase to adjust for inflation.

   - **Total Section 5309 Bus and Bus Facility Grants in Utah County = $3 million.**

c. **Section 5309 New Starts Grants:** FTA also has a separate Section 5309 program for large new starts projects. These funds are proposed for construction of BRT and Commuter Rail. The federal share for these projects generally ranges from 50 to 80%. Mountainland assumes that 70 percent of the capital costs will be federally funded.

   - **Total Section 5309 New Starts Grants in Utah County = $249 million.**

2. State and Other Revenue: Transit Sales Tax Revenue: Between 1985 and 1994 municipalities in Utah County gradually annexed into the UTA system. As those municipalities annexed, local sales tax was assessed at ¼ of one cent. In the past 5 years, sales tax revenue has grown at a rate of about 7.5% per year. In 1999, the Utah Valley Regional Planning Committee approved for planning purposes that an additional ¼ cent sales tax would be placed on the ballet for voter approval within 5 years. It is assumed that beginning in 2004 this sales tax levy will be raised to ½ of one cent. Current and new revenues are projected to increase by 6% per year.

   - **Total Transit Sales Tax revenue in Utah County = $1.6 billion.**

a. **User Fare Revenue:** UTA receives additional revenue from the daily operation of its bus system through farebox collections. UTA's strategic plan states that it is the goal of UTA to obtain 20% of its bus operating costs from patron fares. Mountainland assumes that UTA will receive fare revenue to cover approximately 20% of its bus operating costs. BRT and Commuter Rail systems generally cover a greater share of their operating costs than bus operations. It is assumed that fares will generate revenues equivalent to approximately 30% of BRT operating costs and 40% of Commuter Rail operating costs.

   - **Total User Fare revenue in Utah County = $359 million.**

b. **Other Revenue:** In Utah County, the revenue UTA receives from other sources is mainly from advertising space on buses.

   - **Total Other Revenue in Utah County = $12 million.**

The Projected Transit Revenue 2003 - 2030 table summarizes the various federal, transit sales tax, user fares, and other revenues that will fund the long range transportation plan's recommended transit improvement for the next 28 years.

PROJECTED TRANSIT REVENUE
2003 - 2030

	PHASE			
UTAH VALLEY MPO AREA REVENUE	**1**	**2**	**3**	**TOTAL**
Federal Section 5307 Fund	32 m	59 m	89 m	180 m
Federal Section 5309 Fund – Bus/ Bus Facility	1 m	1 m	1 m	3 m
Federal Section 5309 Fund – New Starts	43 m	206 m	0	249 m
Transit Sales Tax Revenue	204 m	484 m	866 m	1.6 b
Fare Box Revenue	20 m	125 m	214 m	359 m
Other Revenue	1 m	4 m	7 m	12 m
REVENUE AVAILABLE COUNTYWIDE	**301 m**	**879 m**	**1.2 b**	**2.4 b**

Phase 1 = 2003-2010, Phase 2 = 2011-2020, Phase 3 = 2021-2030

PROJECTED TRANSPORTATION EXPENDITURES

The costs for making the needed improvements for highways, transit, Intelligent Transportation System, pedestrian and trail, and park and ride improvements are all analyzed in the long range plan for Utah County. The costs in the long range plan through the year 2030 are estimated. These expenditures include the operations of the highway system, preservation, rehabilitation and replacement of highways, hazard and safety improvements, transportation enhancements (such as landscaping, pedestrian improvements, etc.), other transportation activities, and new capacity to the system.

Transit costs estimates include expenditures for bus, BRT, and commuter rail operation, maintenance, and capital costs. Projected expenditures for all improvements have been adjusted at an annual 4.25 percent inflation rate. Also included are the estimated costs required to meet the needs for general administration and the operation and maintenance of the transit system.

- **Total Highway expenditures in Utah County = $7.3 billion.**
- **Total Transit expenditures in Utah County = $2.4 billion.**
- **Total Highway and Transit expenditures in Utah County = $9.7 billion**

UTAH COUNTY HIGHWAY EXPENDITURES

The highway and other related needs in Utah County are extensive. The current system is stressed with the high growth of the 90's coupled with limited capacity expansion. The expenditures laid forth in this plan cover the costs for UDOT to administer and maintain the current highway network and for the local municipalities and county to administer and maintain their facilities that are a part of the Functional Classified Road System. These activities are the first priority of transportation administers. Adding capacity is also a main importance, but additional revenue must be obtained to fund the large needs of the highway system.

1. Non-Capacity Highway Expenditures: UDOT estimated the cost to meet the needs for the administration and maintenance of the state highway system through the life of the long range plan. Mountainland estimated the cost to meet the needs for the local functional classified roads and local streets. Expenditures are categorized into nine areas including; Operations, Signals / Spot Improvements / Lighting / Barriers, Bridge Preventive Maintenance, System Preservation, Bridge Rehabilitation / Replacement, Highway Rehabilitation / Replacement, Hazard Elimination / Safety / Enhancements, and Region / Department Contingencies. The total costs estimated for these expenditures are discussed below. These assumptions are based on current and historic data concerning these expenses.

a. Operations: Operational expenditures are the costs associated with administering UDOT region and central departments, support services, engineering services, maintenance management, region management, construction management, and equipment management. Operations for local jurisdictions include department administration, maintenance, consultant services, and other activities associated with the Functional Classified Road System. The Utah County area share of UDOT expenditures statewide is based on the region's share of statewide VMT or 13%. The local percentage of operations from revenue available for transportation is 24%. These expenditures were increase by a 2% annual inflation rate.

- **UDOT Operations expenditures in Utah County = $740 million.**
- **Mountainland Operations expenditures in Utah County = $31 million**
- **Local Operations expenditures in Utah County = $689 million.**

b. Highway / Road Preservation: Pavement preservation actions are treatments for streets and highways that are more intensive than maintenance. These treatments range from a

chip seal, up to a full reconstruction. UDOT estimated their costs for these activities. The Utah County share of these expenditures is based on the percent of state lane miles in the area or 17%. Local preservation is for activities on roads on the Functional Classified Road System.

- **UDOT Highway Preservation in Utah County = $310 million.**
- **Local Road Preservation in Utah County = $488 million.**

c. **UDOT Highway Rehabilitation / Replacement:** Rehabilitation and total replacement of a road is costlier than general preservation. These activities happen less often if adequate funding is provided to preserve the life of the system. Rehabilitation and replacement evidentially must occur and is one of the most costly UDOT projects. For the long range plan, many replacement type projects are listed separately as new capacity projects and are not considered a part of this category. This is because many projects include both replacement and new capacity elements. The Utah County share of non-capacity rehabilitation / replacement projects is based on state road miles or 17%.

- **Highway Rehabilitation / Replacement in Utah County = $375 million.**

d. **UDOT Signals / Spot Improvements / Lighting / Barriers:** Included in these expenditures are maintenance and placement of new traffic signals, spot improvements that include intersection and other limited improvements, highway lighting, and barriers. Estimates for these expenditures were provided by UDOT based on current data. These costs were increased by 3% a year to account for inflation. Utah County's share of these expenditures is estimated based on the percent of state lane miles in the area or 17%. These expenditures were increased by 3% per year to account for inflation.

- **UDOT Signals - Barriers expenditures in Utah County = $88 million.**

e. **Bridge Preventive Maintenance:** Keeping the current bridges maintained is one of UDOT's highest priorities. The cost of maintaining a structure is greatly less than total replacement. To estimate the expenditures for Utah County, the percentage of bridges within the county, both on the state road system and local bridges, as compared to total bridges statewide was used or 9%. These expenditures were increased by 3% per year to account for inflation.

- **Bridge Preventive Maintenance in Utah County = $59 million.**

f. **Bridge Rehabilitation / Replacement:** Rehabilitation and replacement of bridges is costlier than general maintenance activities and is required less often if the funding for maintenance allows for the structures to be properly maintained. UDOT estimated their costs for these activities which includes bridges both on and off the state highway system. The Utah County share of these expenditures was estimated based on the percent of structures and bridges in the area or 9%. These expenditures were increased by 3% per year to account for inflation.

- **Bridge Rehabilitation / Replacement in Utah County = $32 million.**

g. **UDOT Hazard Elimination / Safety / Enhancements:** Safety improvements include hazard elimination, intersection upgrades, railroad crossing improvements, and other similar projects. Enhancements to the transportation system include development of trail and pedestrian facilities, bicycle lanes, and landscaping projects. Approximately 10 percent of STP funds are spent on enhancement projects. The Utah County share of these expenditures is based on the region's share of state road miles or 17%. These costs have a 3% per year inflation rate.

- **Hazard Elimination / Safety / Enhancements in Utah County = $57 million.**

h. **UDOT Region / Department Contingencies:** Funding is set aside for each region director and for headquarters for completing tasks and projects that are small in nature or that are unforeseen. In essence this is a discretionary fund to be used at the discretion of the region

directors. The Utah County share of this expenditure is based on state road miles or 17%. These costs have a 3% per year inflation rate.

- **Region / Department Contingencies in Utah County = $22 million.**

2. New Highway Capacity: Adding new capacity to the highway system in Utah County is vital in keeping up with the extremely high growth rate that has occurred within the last 10 years and what is projected in the future. Utah County is handicapped in that the majority of its transportation system was constructed when the area was rural. Most freeway interchanges lack sufficient capacity and new developments are taxing the many under capacity roads and interchanges in the valley. Addressing the problems of the inadequate highway network is daunting. Over the last 10 years when Utah County experienced 40% growth, very little funding was allocated to the area. Future funding projections for new capacity look bleak. A main revenue source, the Centennial Highway Fund, is not proposed to continue, leaving few options for new capacity in Utah County. Future work needs to be done to identify revenue sources to cover this short fall.

As stated in the revenue section of the financial plan, there are five resources for new capacity projects, they include; state revenue, federal revenue, Centennial Highway Fund, local revenues, and private sources. The long range transportation plan estimates the cost to construct new capacity additions to the Functional Classified Road System only. These are the facilities that are eligible for federal funding. They include minor and principle arterials and collectors that will need improvements to meet the transportation demands to 2030. I-15 and the Western Transportation Corridor in north Utah County are the two projects that are not listed in the plan as phased by need. Adequate funding is not available in the plan to address the needs of these facilities when construction is proposed.

Project Costs Estimates: The cost of each new capacity project is derived in one of two ways; estimates from completed studies or on a cost per mile / facility type basis. Costs for I-15 projects were taken from the I-15 Corridor Management Study, costs for Lehi 2100 North/Saratoga Springs 11600 West and American Fork Main St/Lehi 1000 South were taken from the North Valley Connector Study, costs for the Western Transportation Corridor Study were taken from the Salt Lake County Western Transportation Corridor Study. All other project costs were based on a cost per mile, facility type, and right-of-way. All projects have a 3% annual inflation rate averaged to the mid-point of the phase in which the project is to be constructed.

New capacity expenditures listed below are a total of the proposed costs to construct the facilities listed in the LRP. All projects, except freeways, are listed in the plan in the phase they are needed. The majority of freeway projects are either in phase 3 of the plan or are illustrative (not funded). A major effort in the near future will be to identify funding to reconstruct I-15. Current modeling estimates show that the interstate will fail before 2010. Funding to construct the majority of I-15 in 2020 to 2030, as shown in this plan, will not address this major transportation problem.

- **New Capacity Freeway projects in Utah County = $2.6 billion.**
- **New Capacity State Highway projects in Utah County = $1.1 billion.**
- **New Capacity Local Highway projects in Utah County = $431 million**
- **New Capacity Trail/Bike/Ped projects in Utah County = $79 million**
- **New Capacity Park and Ride projects in Utah County = $18 million**

- **Total New Capacity projects in Utah County = $4.3 billion**

- **Illustrative projects in Utah County (non-funded) = $1.4 billion**

PROJECTED HIGHWAY EXPENDITURES 2003 - 2030

	PHASE			
UTAH VALLEY MPO AREA EXPENDITURES	**1**	**2**	**3**	**TOTAL**
UDOT Operations	171 m	256 m	312 m	740 m
MPO Operations	6 m	11 m	14 m	31 m
Local Operations	68 m	173 m	447 m	689 m
UDOT Highway Preservation	76 m	110 m	124 m	310 m
Local Road Preservation	48 m	123 m	317 m	488 m
UDOT Highway Rehabilitation/Replacement	56 m	124 m	195 m	375 m
UDOT Signals - Barriers	17 m	30 m	41 m	88 m
Bridge Preventative Maintenance	9 m	20 m	30 m	59 m
Bridge Rehabilitation/Replacement	6 m	11 m	15 m	32 m
Hazard Elimination/Safety/Enhancement	12 m	19 m	26 m	57 m
Region/Department Contingencies	5 m	8 m	9 m	22 m
Centennial Highway Program	96 m	51 m	0	147 m
New Capacity Freeways	26 m	521 m	2.1 b	2.6 b
New Capacity State Highways	416 m	547 m	163 m	1.1 b
New Capacity Local Highways	35 m	111 m	285 m	431 m
New Capacity Trails/Bike/Ped	14 m	24 m	42 m	79 m
New Capacity Park and Ride	6 m	13 m	0	18 m
EXPENDITURES COUNTYWIDE	**1.1 b**	**2.2 b**	**4.1 b**	**7.3 b**

Phase 1 = 2003-2010, Phase 2 = 2011-2020, Phase 3 = 2021-2030

UTAH COUNTY TRANSIT EXPENDITURES

The transit and other related needs in Utah County are becoming more evident with higher congestion on the highway system. The current system of buses focuses on three areas; (1) Students; (2) Commuters; (3) Special Needs population. Future transit needs include an expanded and more reliable bus system, Bus Rapid Transit route connecting the two colleges to be used as the backbone of local transit in Utah County, and Commuter Rail to relieve congestion on the main interstate traversing through Utah County to Salt Lake City. The expenditures laid forth in this plan cover the costs for UTA to administer and maintain the current transit system. The main focus of this expansion relies on a local transit sales tax and federal participation.

1. Transit Expenditures: The costs for making the needed transit improvements through 2030 were analyzed and included in the long range plan. Cost estimates for general administration and the operation and maintenance of the existing transportation system are also included.

Mountainland worked with UTA to estimate the expenditure needed to implement the long range plan's recommended transit improvements within the Mountainland area. Included in these estimates are operating and maintenance costs as well as capital costs for both existing and expanded services. Recommended major capital investments are the purchase of replacement and expansion vehicles; the

construction of the proposed BRT and Commuter Rail; and the installation of improvements to increase the speed, comfort, and connectivity of transit services. These estimated costs are discussed below.

a. Operating and maintenance costs: Operating and maintenance costs are the total non-capital costs associated with transit services. Local bus service costs were based upon revenue miles traveled because the specific nature of the future routing is unknown. BRT and Commuter Rail are also based upon vehicle revenue miles because of the source material used. Bus corridor operating and maintenance costs, however, are based upon vehicle hours of service that takes into account projected travel speeds. In 2000 Utah County had about 2.9 million annual revenue miles in its regular bus service and another 75,250 annual revenue miles in its paratransit services. The long range plan recommends both of these services will more than double by 2030. The operating and maintenance costs of these services in 2003 were $15.4 million. The projected annual cost of the recommended regular bus system, including a 4.25% inflation factor, is $103 million in 2030. Commuter Rail operating costs are influenced by the economies of scale present in their operations. It is proposed that Commuter Rail will commence operations in 2013. To operate Commuter Rail for 17 years will cost $13-25 million annually for the Utah County portion of the system. BRT operating costs will be $2-5million annually.

- **Total Operating and Maintenance expenditures in Utah County = $1.4 billion.**

b. Capital Expenditures: UTA system wide will need to replace its existing fleet of buses and expand its bus and rail fleet to provide the recommended levels of service in the year 2030. The average age of the current fleet is about seven years. Generally speaking, buses last about 14 years in service. The 2003 per bus cost ranges from $255,000 for a 30-foot bus to $575,000 for an articulated bus. In order to expand service as recommended, an additional 273 local buses, 21 transit-way, and 43 commuter rail vehicles will need to be purchased and housed. Factored into the cost of each expansion vehicle are the costs of its maintenance facility. UTA estimates these facility costs to be $500,000 for each new rail vehicle and $250,000 for each new bus.

1) Construction of Commuter Rail is proposed from Salt Lake City to Provo by 2013. A further extension is proposed after 2030 south to Payson. The cost to construct Commuter Rail from Provo to the Salt Lake County line is approximately $294 million. It is assumed that at least 70% of the capital costs will be federal dollars with the other 30% local funds.

2) Bus Rapid Transit is proposed to begin by 2010 and generally follow University Parkway/ SR-265 in Orem and University Ave/US-189 in Provo. It would serve Eastbay, downtown Provo, BYU, University Mall, and UVSC. The estimated cost, which came from the IRCAA Study, to construct BRT would be approximately $71 million. This would include a combination of dedicated and shared bus lanes, vehicles, and 15 stations.

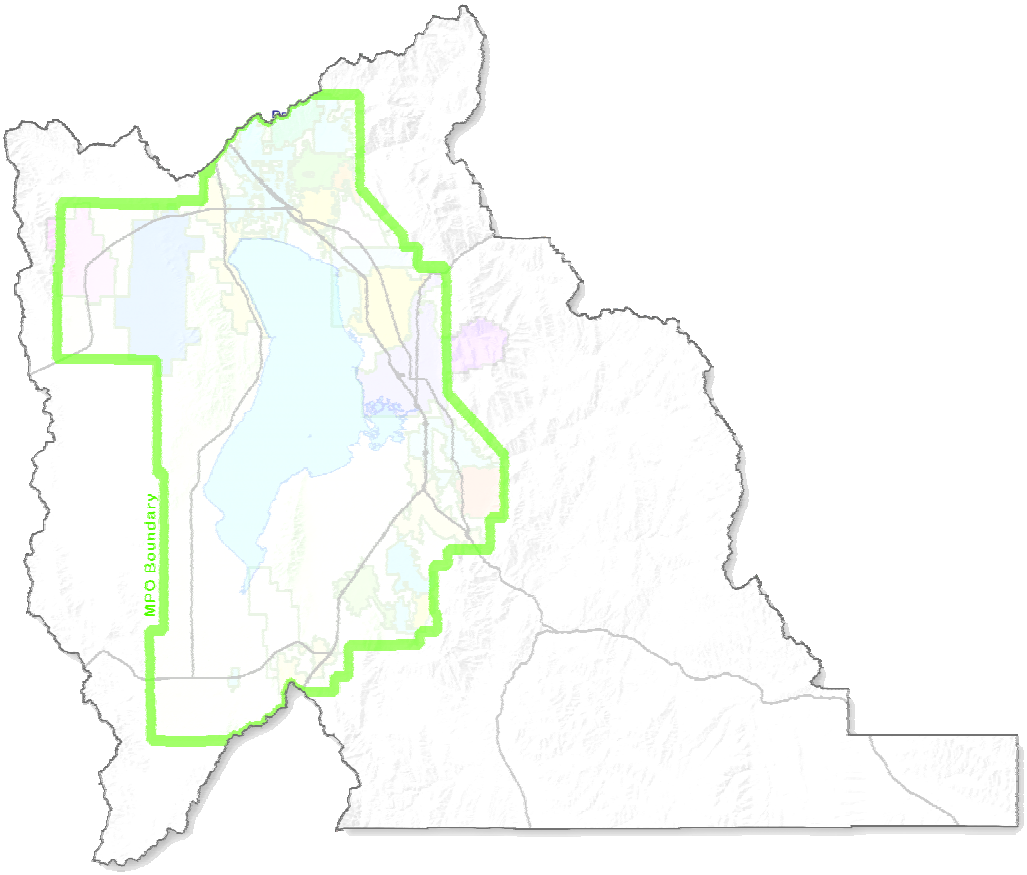
- **Total Capital expenditures in Utah County = $181 million.**

c. Other Capital and Operating Costs: Other capital costs include intermodal centers, transit hubs, new and expanded park and ride lots, bus stop improvements, and transit intelligent transportation system projects. Many of the miscellaneous costs associated with UTA operations as well as the rideshare operations are included in the operating and maintenance costs discussed above. Intermodal centers are recommended for Provo and Orem. The costs for these centers are derived from their environmental assessments at $3.5 million and $2.5 million consecutively. Transit hubs are recommended for downtown Pleasant Grove and downtown Spanish Fork. The cost for each of these hubs was estimated to be $2.3 million dollars. Park and rides are recommended for 14 locations. The Projected Transit Costs table summarizes projected transit capital and operating costs that will be needed between 2003 and 2030 to expand and improve the existing UTA system.

PROJECTED UTAH COUNTY TRANSIT COSTS
2003 - 2030

	PHASE			
Utah Valley MPO Area Revenue	**1**	**2**	**3**	**Total**
Bus Operating and Maintenance Costs	167 m	407 m	794 m	1.4 b
Bus Capital Expenditures	23 m	46 m	112 m	181 m
BRT Operating Costs	4 m	29 m	44 m	77 m
BRT Capital Costs	71 m	0	0	71 m
Commuter Rail Operating Costs	0	123 m	223 m	346 m
Commuter Rail Capital Costs (local Match)	37 m	258 m	0	295 m
EXPENDITURES COUNTYWIDE	**302 m**	**863 m**	**1.2 b**	**2.4 b**

Phase 1 = 2003-2010, Phase 2 = 2011-2020, Phase 3 = 2021-2030



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